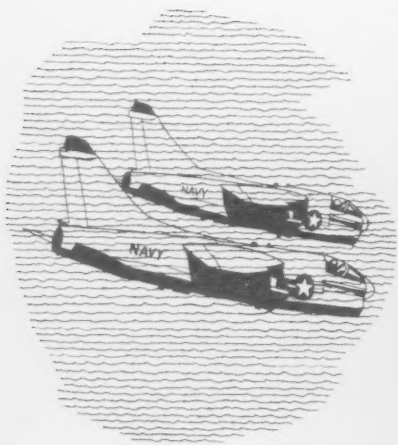


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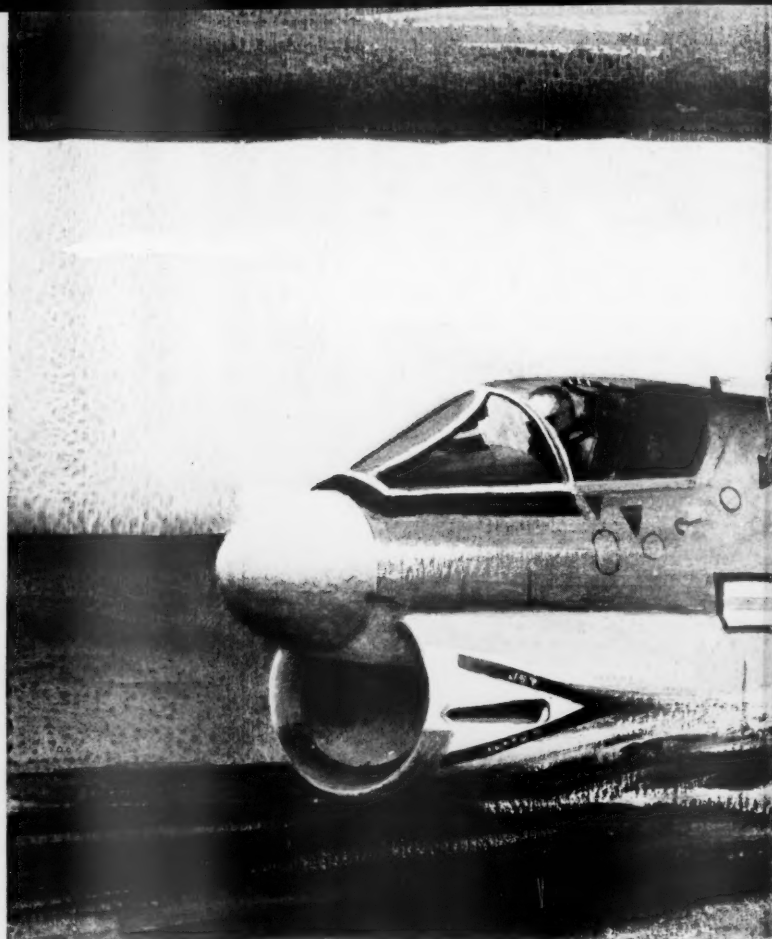
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NOVEMBER 1973 THE NAVAL AVIATION SAFETY REVIEW





CORSAIR II



WET RUNWAY

AN A-7B was launched from the ship to NAS Overseas for FMLP. The pilot had been grounded for about 55 days and needed FMLP refresher before landing aboard. The plan was to land heavy to have fuel left for bounce. Upon arrival, light rain was falling, and there were puddles of water on the 9100-foot runway. Adding to the problem was the fact that no arresting gear was available.

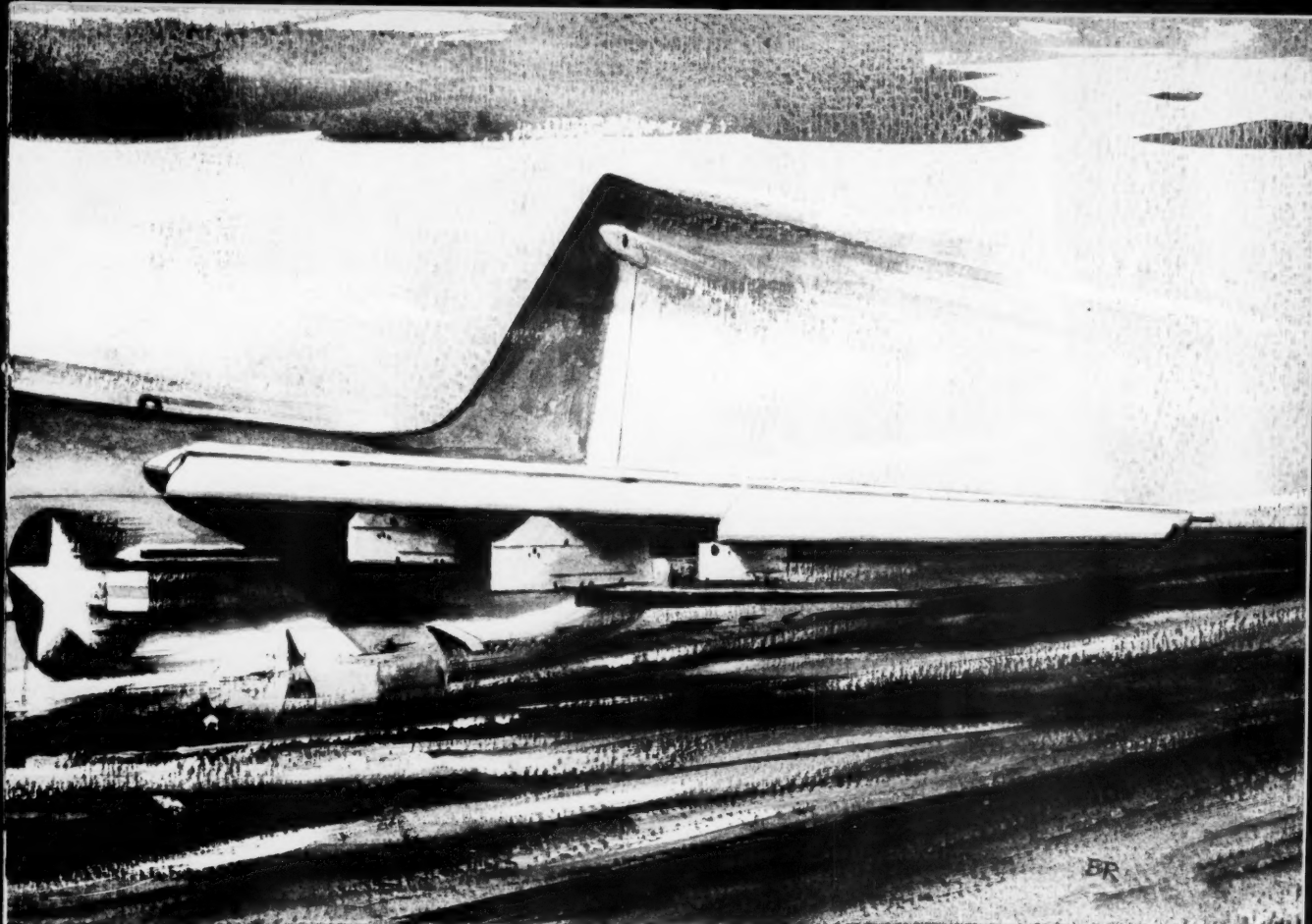
Nevertheless, the pilot attempted a landing with 6000 pounds of fuel. With about 6000 feet remaining, he let the nose fall through and commenced light braking around 100 KIAS. The right tire blew immediately. A right drift began, but the pilot felt he had control of the situation and did not engage nose gear steering. About 1800 feet further down the runway, he blew the left tire. This resulted in a left swerve causing the aircraft to depart the runway with 3250 feet remaining. After leaving the runway, the landing gear failed, and the

Corsair slid to a stop. The pilot exited the aircraft uninjured.

The air wing commander's endorsement to the AAR discussed the factors in this accident in considerable detail. It should be of interest to all aviators, especially to A-7 pilots. The gist of his comments follows:

LT Hackit is widely regarded as one of the top pilots within the wing. Nevertheless, he suffered a series of judgment and technique errors that eventually led to this accident. Although fully aware of the factors going against him (extraordinarily high gross weight, wet runway, lack of arresting gear, and light wind conditions), he challenged them with less than the due regard which they deserved.

LT Hackit had not flown at all in almost 2 months. Although scheduled primarily to meet the requirement for FMLP prior to his next carrier landing, the flight



LANDING ACCIDENT

should have been tasked to cover more than that. It was a FAM flight in every sense and should have included refresher in a number of basic evolutions, including normal field landings. Indeed, the tough landing problem that the pilot faced should have been enough to get the attention of any aviator, even one who had been flying regularly.

After a layoff of 55 days, LT Hackit was in the air for 59 minutes prior to the accident, half of which was logged in the rendezvous circle waiting for his wingman. The remainder of the flight was spent enroute to NAS Overseas and penetrating actual weather conditions to a final landing.

Had the weaknesses of the scheduled plan for the flight captured the attention of any one of a number of squadron supervisory professionals who were being paid to look out for such traps (i.e., NATOPS/Safety/Ops/CO), the accident most probably

would not have happened. This was a refresher hop. The pilot should have been directed to land at minimum fuel regardless of runway conditions after warming up in the landing pattern. Given the unsatisfactory guidance to final with 4000 or more pounds of fuel, he should have at least been cautioned to disregard such a challenge in the event of adverse landing conditions.

The energy crisis has had its impact in recent months. A contributing cause to this accident was that the entire operation was designed (scheduled) to use as little fuel as necessary. Both (so-called) plans for the FMLP required at NAS Overseas were bent on landing the airplane at inordinately high fuel weights. LT Hackit, therefore, felt committed to land heavy, perhaps against his better judgment. Presumably, he did not later on want to be tagged as a "nonhacker" when he was forced to dump fuel to land.

Available weather information was adequate.



Although the NAS Overseas forecast did not call for rain, it was known by the crews that it had been raining there earlier in the morning. The local weather around the ship had cleared nicely by launch time, and so it was assumed that the base, 120 nm to the east, had cleared also. A wrong assumption.

The fact that this pilot had never blown a tire is worthy of note. It most probably accounts for his relaxed attitude towards landing heavy on a wet runway and his feeling that he could control a blown tire without nosegear steering. NATOPS recommendations with regard to the use of nose gear steering under adverse conditions as emphasized by COMLATWING are considered adequate.

For those of us who have blown tires under varying circumstances, the series of events leading up to the accident is sadly familiar and frightening. The difference between a blown tire with loss of face and a blown tire with loss of buttock is dependent to a great extent upon split second reaction and application of proper techniques. In this regard, the A-7 NATOPS discussion on landing under adverse conditions is misleading and needs review. Excerpts from this section are quoted below.

Wet or Icy Runway Landing

Ground roll distance is most dependent on airspeed at touchdown and headwind components. On a wet runway using optimum aerodynamic and wheel braking, the stopping distance increases about 1000 feet for every 10 knots of excess airspeed or 10-knot reduction in headwind component. Whenever runway conditions are adverse, burn down to as light as practical to *reduce touchdown speed*, and never accept a tailwind component.

The foregoing implies that an increase in landing gross weight is reflected only in higher approach speeds. A far more important consideration is the additional energy that must be absorbed during rollout, particularly under adverse conditions.

The A-7B braking system leaves much to be desired when taking on a wet runway, but then so does every other system in our inventory of high performance airplanes. The F-4J, A-7E, and A-6, which employ antiskid systems, can be just as tricky as the A-7B. A suspected malfunction will often require that the pilot secure the system prior to landing or on rollout. Therefore, regardless of whether a skid system is available or not, the pilot must be prepared to stop using normal braking on all landings. The design of the A-7B braking system is no less adequate to handle wet runway landings than other high performance airplanes. The lack of an antiskid system is not considered a contributing factor.

The current NATOPS go-around criteria are on the conservative side (80 KIAS minimum with 4000 feet remaining). These figures apply to a 25,000-pound airplane (6000 pounds of fuel). The go-around figure for a more normal landing weight (21,500 pounds) should be highlighted. The remaining runway length required is 3000 feet, or even less at lighter fuel weights. As important as the actual data itself is the idea that a go-around can be executed very late in the rollout, even after braking has commenced.

This endorser is an outsider to the A-7 community, although I fly their airplanes regularly. While going through the RAG early in 1973 and flying the A-7 for the first time, I received some very definite first impressions that have not been proven wrong. I'd like to list just a few that relate to this accident.

- The A-7 community as a whole reflects the finest

The A-7 community in general does not treat the heavyweight field landing with due regard.

qualities of professionalism, proper aggressiveness, and spirit that has always been so vital to the Navy.

- A-7 pilots develop confidence in their abilities more rapidly than multiplaced aircrews. They learn to depend upon themselves early in their training, since they have no choice in the matter.

- The A-7 community in general does not treat the heavyweight field landing with due regard. This is because the A-7 carries a very generous supply of internal fuel (even lightloaded to 8000 pounds) for most training missions, has no afterburner, can only dump wing fuel, and has very good wheel braking characteristics on a dry runway.



The A-7 pilot gets into the habit of landing with what fuel is "left over." He generally gets away with it nicely by landing on long runways oriented into the wind. With the Wet Runway Bill in effect at Homebase this past year, he probably got little or no experience rolling out on a wet runway. Landing with fuel loads up to as high as 5000-6000 pounds, therefore, does not excite A-7 pilots as it should. I'll wager that the average F-8 pilot would not dream of landing on any runway, much less wet, with 5000-6000 pounds, nor would the F-4 pilot with 7500 pounds or so. Yet, the degree of difficulty is comparable in all three cases.

The energy crisis has compounded the situation. There is even greater emphasis now to land with what's left rather than dump. Recommend fuel be managed to land with what's right. Under adverse conditions, the low fuel warning light is closer to right than 5000 pounds plus.

There is great resistance within the A-7 community to any thought of shutting down the engine to decrease stopping distance. In discussing this matter with RAG instructors and an LTV engineering test pilot at a LATWING safety symposium early last year, the feeling was that shutting down offered little help in reducing stopping distance and most probably would induce directional control problems. Do not concur with this attitude as a general rule. NATOPS does not treat residual engine thrust at idle RPM and the effect of shutting down the engine. Agreed, normal braking and nosewheel steering are vital in most situations, but how about the landing on 4000 feet of dry runway, wind calm, and no place else to go? Or, the same as above with an even longer wet runway? A-7 drivers will continue to face situations that might best be handled by shutting down when ready to commit to a precariously short and/or wet runway. NATOPS needs help here. If test data is not available, then it should be obtained.

A-7 NATOPS weaknesses with regard to adverse landing procedure should be corrected promptly, but are not considered to be a contributing factor in this accident.

Runway drainage conditions at NAS Overseas, although stated as being poor and, therefore, certainly a factor in this accident, are not considered to be a direct cause.

The command erred by strongly influencing the pilot in his attempt to land on a wet runway with 6000 pounds of fuel under no wind conditions. Adequate command attention was not given to all aspects of this warmup hop, thus contributing directly to the cause of the accident. ◀



AIR BREAKS



4

Wired Backwards. Warning lights in any cockpit are designed to provide the crew with information when something isn't kosher. When a red light illuminates, pilots use the information to decide whether to land as soon as possible, secure a system, or make plans to do something else. It could be a sign that an otherwise routine flight is no longer routine.

The pilot of an SH-3 was on a local VFR training flight when, about 10 minutes after takeoff, the tail rotor gearbox chip light came on. He made a precautionary emergency landing in a vacant school playground.

The maintenance experts back at Homeplate were notified and headed for the playground. They pulled the tail rotor gearbox chip detector, which revealed no problem, and were on the verge of recommending that the aircraft be

flown back to base.

Further troubleshooting disclosed another problem. It was discovered that the tail and intermediate gearbox chip detectors were cross-wired and that the chip light in reality was a signal from the intermediate gearbox. The latter was covered with metal chips.

The aircraft was towed to

Homeplate. A serviceability check was pulled, and when results proved negative, the gearbox was returned to service.

Instructions and illustrations in NAVAIR 01-230 HLC-6-4 detail procedures for checking the integrity of the intermediate gearbox chip light. If these procedures had been complied with, the mistake in wiring would have been apparent. QA, where were you?

A Quiet Mentor. Last fall, a naval aviator took off in his trusty T-34 on a routine demo flight with fuel tanks full. After spending 20 minutes or so at altitude, he began a descent for an approach and landing at a civilian airport. Upon reaching 1500 feet, about 2-3 miles from the airport, his engine quit. The pilot dropped his gear and flaps and executed a beautiful landing into a cornfield. There was no damage to his aircraft or injury to himself or passenger.

Investigators took the pilot to task for failure to conduct a proper preflight. The fuel filter assembly drain valve was found to be open. This allowed fuel to be pumped overboard through the nose fuel drain line, and after about 35 minutes of flight, fuel starvation



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occurred.

Prior to takeoff, the pilot didn't have a qualified outside observer, or the fuel stream resulting from the open valve would have been seen. Since other pilots almost daily perform these demonstration flights to prospective aviation students, it behooves all pilots of T-34s to be familiar with this peculiarity.

The requirement to have a qualified firewatch when starting engines is not waived when at civilian airports. In addition to having the firewatch (with a CO₂ bottle at the ready), the firewatch can readily see if there is a *leak of any kind* on turnup and signal the pilot. It might save your hide.

Don't Send a Boy... Moving aircraft from the line into a hangar is a ground operation performed thousands of times. Sometimes, the move is made with a full ground handling crew; sometimes, it isn't.

A crew of three, E-4 in charge, were directed to move a Piper *Aztec* into the hangar. No tow tractors were available. Before the can-do troops started to muscle the U-11A, the E-4 requested additional, qualified personnel. The senior petty officer in maintenance control, however, told him to get lost.

No one bothered to fully open the hangar door, and while maneuvering the U-11A, it contacted the door with the starboard wingtip light. They backed off, straightened the *Aztec*, and pushed it into the hangar. Now, the aircraft would have to pass under the starboard, horizontal stabilizer of a C-118.

They made it most of the way, until the vertical stabilizer of the U-11A was stopped by the trailing edge of the C-118 horizontal stabilizer. Twice in 10-15 minutes, the *Aztec* was dinged! Damage to both aircraft was slight, but it makes you wonder what else those guys would have hit if someone hadn't stopped them.

That aircraft movement was a fiasco from the beginning. It is unbelievable that any supervisor and rated man could be so grossly negligent. It would be fitting to report that the supervisor and plane pushers are in jail, but the CO of the unit didn't even report holding mast.

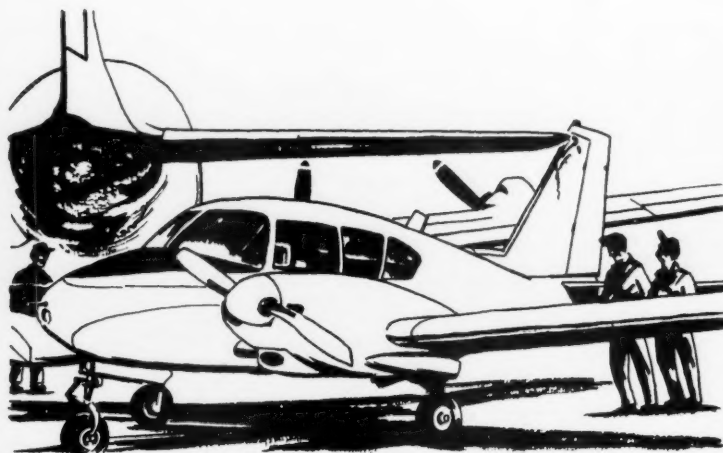
Would you like to know how it was whitewashed? There's a new requirement for all personnel assigned to night crew duties to attend a lecture concerning the movement of aircraft and a requirement *will be made* for the

night crew chief to supervise all future aircraft moves.

Trouble on the Rollout. During transition to landing configuration after break on a normal field entry, the pilot of an A-7E inadvertently placed the flap handle to UP vice DOWN when bringing it out of isolate position. The pilot realized the aircraft was excessively fast on touchdown. He was the fourth aircraft in a four-plane flight and observed rapid closure rate on No. 3 aircraft in front of him. He advised No. 3 to maintain the starboard side of the runway and he would overtake him on the port. Additionally, he advised the No. 2 aircraft to move from port to starboard due to excessive closure rate.

Antiskid was safety wired off due to a previous malfunction and was therefore not selected. The starboard tire was blown at 3000 feet after touchdown. The aircraft remained on the runway and shredded the starboard tire and ground down the starboard brake assembly. The A-7 engaged the E-28 arresting gear at the 12,000-foot mark with the starboard brake assembly at approximately 10 knots. By then, the port tire fusible plugs had melted and the brake assembly froze. The arresting gear engagement brought the aircraft to a stop after 40 feet of rollout.

The pilot had been concerned with timing his break and then trying to establish his interval. His failure to put the flaps down compounded the interval problem which may be the reason he didn't check his cockpit landing checklist or notice the flaps indicator or wheels/flaps warning light flashing. All pilots in the command have been rebriefed on the importance of checking the cockpit-mounted lists prior to every takeoff and landing. ◀





Fatal Hard Landing

A FLIGHT of three F-4Js arrived in the vicinity of NAF Overseas on an IFR flight plan. They were cleared to descend to 10,000 feet and instructed to contact approach control. They were informed that it was raining at the field, but visibility was 10 kilometers. The flight was unable to contact Approach and was given an alternate frequency. During this frequency change, No. 2 lost radio contact with the flight. No contact was made on the alternate frequency, and at this time, lead decided to continue the descent to 2500 feet as he was VMC. Contact was finally made with the tower at 2500 feet and the flight was sent back to approach control.

The state of navigational gear within the flight was poor, especially No. 3, who was without TACAN, radar, and nav computer. The field was found by using a combination of lead's TACAN azimuth and DME reports from No. 2. Although the viz had been reported as 10 kilometers, the field was not picked up visually until 3nm.

The flight broke at 1500 feet MSL, approximately at midfield. At the 180 degree, lead acknowledged that the arresting gear was not rigged and that the first 100 meters were unusable. He extended downwind and turned final. At the ninety, he lost contact with the runway, but assessed that his pattern was good and continued, finally picking up the runway at about three-fourths of a mile and landed normally. Lead had no problems on the short, wet runway and transmitted that braking action was "not that bad."

Although No. 2 experienced the same conditions during the approach as lead, he decided to wave off at 600 feet.

After establishing a rate of climb, he paralleled the runway heading, seeing the ground visually abeam the 2000-foot mark. From here, he turned downwind.



Number 3 made a normal 180-degree transmission and gave no indication of any possible internal cockpit troubles. It is not known if No. 3 experienced the same visibility difficulties turning final, but he was visible from the ground from the ninety to touchdown. On short final, he was well above the desired glidepath. Although he appeared in a good attitude, his sink rate was excessive, according to several witnesses. He was also judged to be lined up slightly left. At about the position where lead picked up the runway, No. 3 was observed to nose over, probably in an attempt to land nearer the end of the runway.

The *Phantom* was still high as it crossed the threshold, and the nose began to rise. The aircraft appeared to two witnesses to stall in a very high noseup attitude and landed on its left main gear 1135 feet from



the threshold. Most witnesses verify that it was an extremely hard landing.

The aircraft probably had right lateral control applied as a final lineup correction. This input, coupled with the high sink rate, caused the starboard main landing gear to collapse on impact. The oleo assembly was pushed up into the wing, severing the linkages to the starboard control surfaces.

The pilot deployed the drag chute on touchdown, but the F-4 started to veer right. The starboard wing was dragging on the runway, and the streaming fuel ignited. The pilot went into afterburner in an unsuccessful attempt to get airborne. The aircraft left the runway at the 2790-foot mark in a nose-high attitude at high speed.

After 370 feet of travel on grass, the aircraft crossed a taxiway, still nose high. Beyond the taxiway, the nose

dropped down hard. The nosewheel collapsed causing severe damage to the front cockpit floor and struck the underside of the front ejection seat fatally injuring the pilot.

The nose dug in, and the tail rose as the aircraft rolled left. After approximately 80 degrees roll, the RIO was ejected (outside the envelope), sustaining fatal injuries. The aircraft finally came to rest 1312 feet after leaving the runway.

In the meantime, No. 2 was orbiting. He was diverted to another field where he made a safe landing.

The cause of this accident seems clear cut — the pilot made an extremely hard landing. Nevertheless, there were other contributing factors. The flight leader, in his brief, failed to brief the flight on a possible divert to an alternate. He descended VMC in marginal weather conditions while on an IFR flight plan and overlooked the advantages of a GCA (manned and operational) as an aid to making a good approach to the short (7200 feet), wet runway. Moreover, there was arresting gear available, but lead failed to request that it be rigged.

All of this, combined with poor nav aids, may have caused the young pilot to "go for the runway" in preference to waving off (and possibly going IFR), in spite of the fact that he was in an extremely poor position for landing on that pass.

The pilot no doubt believed that he possessed sufficient skill to salvage a good landing out of a poor approach. He was considered to be a very good pilot by those who flew with him and had received considerable praise in that regard.

Although he was also considered a careful pilot and pursued his job as safety officer seriously, the board found evidence of a recent trend toward overconfidence in his flying. On a recent takeoff, he made a low transition and hard turn for an early rendezvous. This was considered dangerous and was reported to his CO.

He had previously made a hard landing at this same field, but apparently it was not reported to his commanding officer. He was observed subsequently to make two more hard landings which were also not reported.

Since these observations are at variance with his demonstrated knowledge of and ability to perform correct techniques, it must be assumed that he had either begun experimenting with new techniques or had begun to accept less precision in his flying, both of which would be consistent with overconfidence.

To sum up, this accident might well have been prevented by a go-around. It also might have been prevented by better leadership and supervision by the flight leader or concerned action by those who witnessed the hard landings preceding the accident. ◀

A TPC sadly reached for various controls from the right seat as he cut the mixtures, secured the fuel, and switched off the mags and battery. He gave the order to the flight attendant to evacuate the aircraft and reluctantly followed everyone out. The transport had come to rest about one-fourth of a mile after it swerved 45 degrees left of the runway on takeoff and went hell-bent-for-election toward the boondocks. *Someone* eventually pulled the power off and raised the gear. Otherwise, the aircraft might still be rolling. This accident was a classic example of why there must be . . .

COCKPIT COORDINATION

AFTER the prologue, it doesn't take much imagination to assume that:

- Preparation had been nil.
- There had been little, if any, cockpit brief.
- There had been no supervision of the copilot (not a designated T2P).
- Crosswind conditions were at or above aircraft limitations and definitely exceeded the copilot's capabilities.

The aircraft received strike damage, but no one was injured, and there wasn't any property damage. Change the scene to nearly any metro airport or major military installation and there could have been a major catastrophe.

Although the article is written as if only transports and transport designations are involved, it also includes patrol, antisubmarine, early-warning, and helicopter models and their corresponding designations such as PPC/CAPC/HAC. Each time the term TPC is used, readers are advised the above designations, where appropriate, are included.

Planning. Even if the flight is point-to-point, for the umpteenth time, there is an important requirement for the pilots to sit down together, discuss the mission, break out charts and publications, cover the nav aids and frequencies to be used, consider the weather, work up a weight and balance form, and decide what fuel load, what cargo, and how many passengers are expected.

While the pilots are thus engaged, a good flightcrew will be busy preflighting the aircraft, checking passenger provisions and survival gear, and making sure the necessary web straps and tiedowns are available for the load and passengers to be accommodated.

Before passengers are loaded, the TPC should brief the entire crew, cover any special conditions for the flight (altitudes requested, weather expected, time enroute), creature comforts (such as operation of the seatbelt/no smoking signs, food and drink availability, passenger movement/cockpit inspections), and ensure there is a full passenger briefing.

Cockpit Briefing. Before the engine-start checklist, the TPC, if he's a pro, will brief in detail what he expects and wants his copilot and flight engineer to do, how it's to be done, and in what sequence. You'd better believe there's no place for the words "standard briefing" or "same as before."

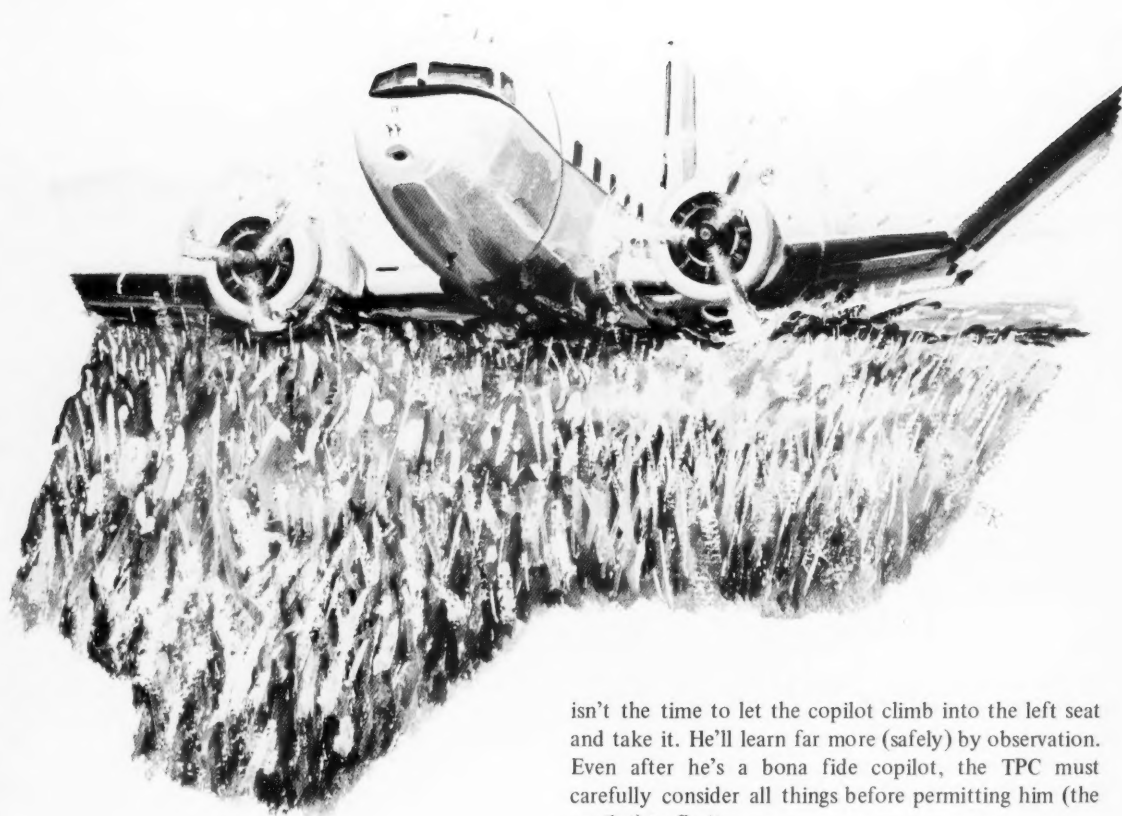
When a pro covers emergencies, he covers them. Starting with control of the aircraft, he leaves no doubt who's got it, who'll take it, and under what conditions control will change. Next, he'll discuss the first possible, unusual event — the abort. He will clearly state who will decide and when. It'll be spelled out. Then he'll consider and discuss that one-in-a-million shot of what will be done if an immediate landing/ditching is necessary.

Airborne emergencies, such as a lost engine, electrical or hydraulic failure, fire in flight, decompression, etc., should not be slighted. The TPC will advise whether he wants to return to the departure point or continue. Certainly, during the brief, there will be a few words on the importance and use of checklists. He'll probably emphasize the need for challenge and reply. Finally, he'll probably be pretty specific about no "secrets" in the cockpit.

Supervision. One reason there is a TPC is that someone with the experience, moxie, and seniority (in model, not rank) has to know *everything* that's going on and will be the one to "call the shots."

The TPC and the T2P should occupy designated seats. If the copilot is permitted to take off, the TPC, in his brief, must leave no doubt who'll fly the aircraft or how control will be transferred. In the prologue, *no one remembered pulling the power off!*

Safety Center records are full of mishaps in which the TPC let the copilot go too far before attempting to salvage the maneuver. The TPC must be ready to take control at the first sign of trouble to ensure the maneuver doesn't get out of hand. It's less painful for the TPC to talk it over with his T2P, after assuming control, than to try to explain to the mishap board why he dinged the bird. There is a mistaken belief, among too



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many pilots, that a copilot has to learn the hard way. Mularkey! Lives and aircraft are too precious. For example, in the prologue, the aircraft rolled for 1500 feet, none of it straight, before departing the runway.

Existing Conditions. The time for copilots to receive experience/training is in an empty aircraft on a fam flight when he has everything going for him. When the weather is lousy, the runways wet, or in a max crosswind

isn't the time to let the copilot climb into the left seat and take it. He'll learn far more (safely) by observation. Even after he's a bona fide copilot, the TPC must carefully consider all things before permitting him (the copilot) to fly it.

Summary. The TPC designation is usually granted *only* after an individual has demonstrated a thorough knowledge of an aircraft by written and oral examination. He must have successfully completed a long, arduous flight syllabus encompassing hundreds of hours. He has demonstrated the ability to employ the aircraft aeronautically and tactically and the ability to operate it anywhere in the world, under any circumstance. Along with all the doing and demonstrating, he must have exhibited exceptional headwork. ▴

FOOLED BY MOTHER

MOTHER Nature sometimes is a bad mother. Despite every precaution in the book, plus a few extra, she can foul the best laid plans. The following two ground accidents will illustrate how damage to several aircraft occurred by fooling with Mother.

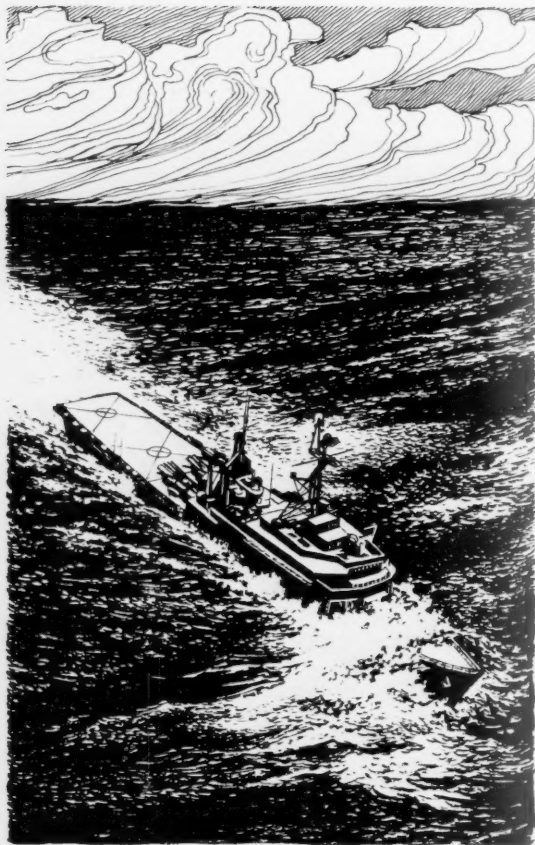
CH-53 Mishap

Three CH-53s were aboard an LPD in WestPac when typhoon warnings were received. The aircraft were spotted as far forward as possible with optimum separation. They were secured with 12-point tiedowns, chocks were tied to the nose and main gear, rotor brakes and gust locks applied, jury struts installed with all rotor blades lashed to the blade end of the struts, side blades lashed to the struts and the aircraft, tail pylons folded with struts installed, and the tail rotor blades tied to the aircraft.

Even with these precautions, Mother Nature just laughed. About 24 hours later, with heavy seas and screaming winds, the first damage occurred. The No. 2 blade on the port aircraft broke its restraints, swung to starboard, and meshed with its tail rotor blades. Initial attempts were unsuccessful in capturing the blade because of 15-foot waves and 50-knot winds.

The ship penetrated the eye of the typhoon, and during the lull, additional lashings and straps were applied to the birds. As the ship emerged from the eye, winds, recorded about 65 knots, ripped the No. 5 blade loose on the starboard aircraft, securing lines parted, and the blade flew to starboard. The wild blade wiped out two ship's antennas and one tail rotor blade.

The CO of the ship changed course to shift the relative wind, and the blade was restrained with nylon lines. Before the ship escaped from the typhoon, damage was inflicted on six blades that had parted from their struts, five tail rotor blades, and other parts of the helos.



NATURE



P-3C Mishap

The *Orion* was preflighted in the hangar for an operational flight. After the preflight had been completed and ice removed from the aircraft, it was towed out to the ramp for fueling about 30 minutes before scheduled departure.

Fifteen minutes later, while fueling, the flight was cancelled and fueling stopped. The aircraft was then towed to a regular parking spot. The towing crew

consisted of a director, a tow tractor driver, chockmen, wingmen, and a couple of tail lookouts — all experienced heads. The area was flat, and tow speed was slow and careful.

During the tow, with winds between 25 and 30 knots on the beam, a gust blew just as the crew was crossing a patch of glare ice. This caused the big P-3 to jackknife, and the nose radome zapped the tow tractor. ◀

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Summary

Neither of the ground accidents resulted from carelessness, inexperience, or actions of unqualified personnel — the usual reasons for ground accidents. Proper planning was instituted in both cases before becoming involved with Mother Nature. Damages in each mishap were held to a minimum because of the care taken. The point of this article is to illustrate what happens when you fool with mother nature.

DO YOU really understand all of the problems associated with getting out of a helicopter during emergency situations? As a crewman, you most certainly should, and as an occasional passenger, you should educate yourself prior to each flight. Knowledge of this sort is good insurance, and NATOPS specifies that the HAC (helicopter aircraft commander) will ensure that all personnel aboard have been given a briefing on emergency procedures. Until such time that proposed methods for improved egress capability are implemented, close attention to these briefings could save your life!

Two different concepts of inflight emergency systems are being pursued. The first one involves inflight egress from the aircraft and is only applicable to helicopters with a two-man crew. This concept has two modes, extraction and ejection.

The first mode is intended for use in the AH-1 *Cobra* helicopter and is an *extraction* system. Here's what happens: rockets extract the crewmen *after* the rotor blades are sheared, the canopy jettisoned, the gunsight stowed, and the fuel shut off, then they are recovered by individual parachutes. Technical documentation of this method has been completed, and design verification testing and qualification plans are being formulated. This system is scheduled to be installed in H-1 production models (G-J-Q) by the end of FY-76.

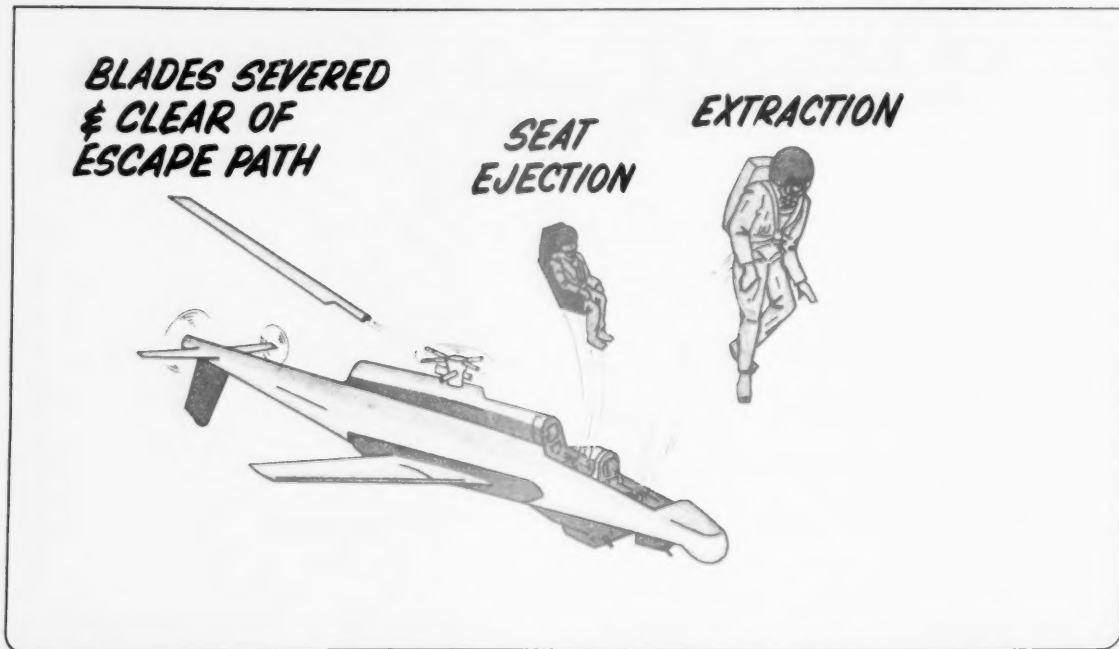
HELO:

The second mode is a *seat ejection* system. This innovation in ejection seats for helicopters is scheduled for test and evaluation by Douglas Aircraft Company soon. This unit has been designated "MINIPAC." Subsystem components and ballistics are to be off-the-shelf items or usable from previous Douglas ejection seats. Installed, "ready-to-go" weight in an aircraft will be less than 70 pounds per seat. Its design includes safe escape from zero to 250 knots speed, from the ground up to 10,000 feet altitude, and gives the crewman an inflated parachute in about 2 seconds. This ejection system will be compatible with most existing helicopter cockpits, is self-contained, and requires no mounting of components elsewhere in the aircraft.

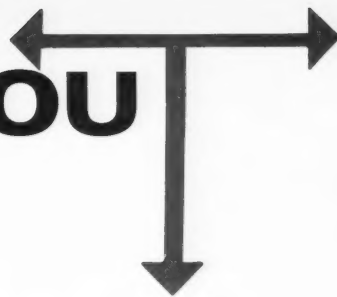
Another inflight emergency system concept, applicable to larger multiplace helicopters, does not involve inflight egress. This HEPS (helicopter personnel escape protection and survival) system is designed to bring the aircraft fuselage safely down to earth, after which a more or less "normal" egress can be effected.

The system consists of the following series of events: ballistic main rotor severance, tail rotor severance,

EXTRACTION SEAT SYSTEM



NO EASY WAY OUT



vehicle recovery parachutes deployment (number of chutes determined by model aircraft), and retro rocket firing. Occupants are protected on the earth through the use of crash resistant fuel systems, crash attenuation bags and crashworthy seats. Flotation devices are activated for water impact.

This type of modular recovery will provide a more stable situation for egress after landing. Funding for investigation and development of weight and volume reduction of the recovery system has been tentatively approved for FY-75. Funding for the other portions of the HEPS program has been held in abeyance for future consideration.

So much for inflight escape and automatic controlled emergency descent followed by "normal" egress. Another environment which presents tremendous egress problems is *underwater*. When a helicopter crashes at sea, its occupants are faced with problems that require proper equipment, training, and self-control to egress and survive. If the crash is in deep water, the aircraft will probably either break up into various sized sections or remain intact but flip inverted, fill with water, and sink.

By LCDR Robert B. Recknor
Naval Safety Center

This evolution naturally creates disorientation which, combined with darkness, would create panic in most people. To provide a better survival ratio than we now have, numerous ideas are being developed. These include hatches that will automatically be released or ballistically separated from the aircraft, the use of MDC (mild detonating cord) to create additional escape hatches in the sides, tops, and bottoms of aircraft, perimeter lighting outlining the escape routes automatically, and seatbelts that will automatically release. These systems will be dependent upon water pressure and/or timed water immersion. In all systems, there will be a manual actuation feature.

In addition, new training procedures are being

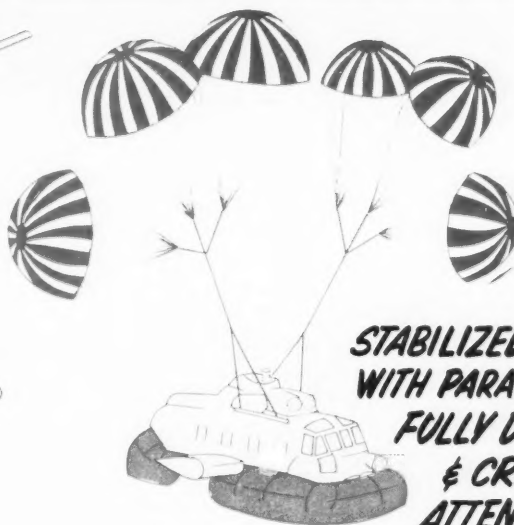
13

MODULAR RECOVERY SYSTEM

**LARGE
HELICOPTER**



**BLADE & TAIL
SEVERANCE**



**STABILIZED MODULE
WITH PARACHUTES
FULLY DEPLOYED
& CRASH
ATTENUATION
BAGS INFLATED**

generated. A Universal Helicopter Underwater Escape Trainer is being developed by the Naval Training Equipment Center in Orlando, FL. Training in this device will be similar to the fixed-wing "Dilbert Dunker" and will provide trainees an excellent opportunity to develop confidence in their own ability to survive an emergency situation. They will learn to develop a sense of direction, the value of keeping their eyes open, how to avoid being thrown around, and the importance of staying strapped in until the aircraft is completely flooded to minimize disorientation created by intruding water.

These drills in underwater escape are intended to be an exercise in preventing panic, since successful escape from a chaotic and anxiety-producing situation, such as being trapped in a sinking, inverted helicopter, may depend largely upon reflex action. Therefore, the trainer will provide experience in manual release of restraints which are identical to those used in the aircraft. As a result of training, many aircrewmembers, injured and/or in shock, have been known to perform each step (and there are several) precisely and in correct sequence. They have been recovered unconscious and later have had no recollection of how they reached the surface.

Emergency procedures should be *practiced*, so that any sudden impact with the water will trigger correct responses rather than produce undue emotionality ("Panic" — Troops!). The proposed Universal Helicopter Underwater Escape Trainer, called "Device 9D5," should provide the necessary realistic training. At present, a requirement for seven such trainers exists. Tentative plans include placing them at the following locations:

U.S. Navy

NAS Pensacola, FL
NAS Jacksonville, FL
NAS North Island, CA
NAS Norfolk, VA

U.S. Marine Corps

MCAS New River, NC
Camp Pendleton, CA
MCAS Kaneohe, HI

The Chief of Naval Operations has so far authorized procurement of one trainer to be located at NAS Pensacola. This procurement is being held in abeyance pending completion of an urgent minor construction project for a facility to house the device. Once delivered, a training effectiveness evaluation will be conducted on the first device to provide the basis for a decision for procurement of additional units.

Land crash situations present other types of problems. When the aircraft makes uncontrolled contact with the ground, it results in problems like ruptured fuel and hydraulic lines, jammed hatches, shattered glass, and seat and restraint failures. Personnel are thrown rapidly in various directions, fire can (and does) occur, and general confusion is always present. Improvements which will enhance survival probability in land crash

MINIPAC SYSTEM



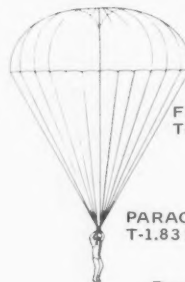
PARACHUTE LINE STRETCH
T-0.95 SEC



PARACHUTE DEPLOYMENT



MAN/SEAT SEPARATION
T-0.45 SEC



PARACHUTE FULL INFLATION
T-1.83 SEC

CREWMEMBER/AIRCRAFT
CLEARANCE T-0.29 SEC



FIRST SEAT INITIATION
T-0.0 SEC



Escape Sequence — 150 knots

situations are in the mill.

Crash resistant fuel systems have been developed which will reduce the danger of fire on impact. Crashworthy seats that redistribute body stress and remain attached to the airframe can further decrease injuries to personnel, when used, and allow them to be better prepared for egress after movement has ceased.

In an effort to reduce the tragic loss of lives and multimillion dollar accident price tags, these programs for helicopter egress are being vigorously pursued. But austerity in funding for research and development phases slows the progress at various intervals. In spite of the multitude of counter-productive considerations, these programs, with associated training and equipment, can produce a safer, mission-ready helicopter force.

With the expansion of the numbers and missions of rotary wing aircraft, the need for improved egress methods continues to increase. The need for viable systems designed to get aircrewmembers and passengers safely out of helicopters in flight and after ground or water crashes is vital.

How can we improve helicopter egress capability? Are you thinking? Submit your ideas, NOW! Safe is better than . . . Oops . . . Sorry!



The "Scapegoat"



I JUST couldn't hold onto it. I suspect there was some kind of control failure, or else the downwind oleo collapsed just as I approached flying speed. Maybe a tire blew, but then I didn't touch the brakes during the roll. I had done everything right — complied with NATOPS all the way — but just couldn't hold onto it.

As soon as I saw we were going off the edge, I told my rear seat stick to stand by. I punched us both out as the bird homed in on the arresting gear enclosure.

Funny thing. As the canopy blew and the rear seat "exploded," I thought — perhaps I'd forgotten something. Was there anything else I could have done to save the bird? No! Nothing! I had tried my level best. I was in the clear. ("In the clear?" Where did that thought come from?)

After a quick checkup for me and my back-seater at sickbay, and treatment for a skinned elbow, I went back to the scene where the one winged, seatless *Skyhawk* perched on its one remaining gear.

The skipper, there with the ASO and Ops, wanted to know how I was and did I feel like talking right then.

"Sure, skipper, I'm OK." Wish I could have said the same for 307. She was a strike for sure.

The safety officer had his duty tape recorder, so we moved away from the immediate site so I could give him my side of the story. (There it goes again! "My side of the story?" What other side was there?)

The ASO started asking a few questions, and I wondered if the mike would pick up our words because of the wind. (Wind? My God! What did the tower say the wind was when they cleared me to roll? It was nearly 90 degrees from the right, but not bad enough to push me off the runway. No. No sweat in that area.)

ASO: You say after Tower cleared you for takeoff you lined it up in the middle of 28?

Me: Right down the centerline.

ASO: What winds did the tower give you?

Me: Uh . . . let me see. Something like, variable 360 to 010 at around 12 to 15. I remember it was a little gusty. Up to 25 knots or so. But I've never had any problems with crosswinds — especially on takeoff. Hell, I've got close to 2000 hours in the A-4. That should count for something.

ASO: Yeah, you oughta know what the bird can do and can't do by now. Uh, Bob, did you think about

aborting when your port tire failed?

Me: What port tire? I mean, I didn't have a blowout — did I?

ASO: Sure did. Take a look at what's left of your port tire. Nothing but threads; the rim's all chewed up.

Me: (That tire had a bunch of plys showing when I preflighted. The troubleshooter wanted to change it, but I told him not to sweat it — that I was only going to make one landing.)

ASO: Another thing. Neither droptank ruptured, and from what I can tell, it looks like your right drop was only half-filled. Didn't you check them visually?

Me: (Half-filled! Hell, they both sounded full when I tapped them on preflight. Damn plane captain didn't have the caps open — and I was in a hurry.)

ASO: Tell you what, Bob — why don't you go ahead and knock off the rest of the day? When you feel up to coming in tomorrow, we'll talk about it. Right now, relax. OK?

Me: (Relax? That's easy for him to say. It's not all hanging out for him. Have one little accident and they twist things around to make you the scapegoat. Why don't they pin it on Mother Nature? The crosswind was her idea. I was just doing my job.)

Well, the CO didn't want me to drive home, so I called my wife to pick me up.

Leaning against the hangar, waiting, I decided that I was a victim of circumstances. This day, this one lousy day, all the odds were stacked against me. I was handling the situation no sweat, 'til my luck ran out. Should have checked my Bio-Rhythm chart this morning — it's probably a critical day.

If it hadn't been for that complacent plane captain or that idiot who fueled the bird — or if the troubleshooter had gone ahead and changed that weak tire despite my objections — I wouldn't be in the AAR limelight now.

Another thing. Tower should have been more explicit in their wind information. Hell, I was busy briefing that nugget rear-seater on how to contact Departure.

Oh, well, I still think the oleo bottomed out, and I couldn't get full throw on my ailerons into the wind. They'll more than likely find something jammed in the aileron power package — or whatever.

Here she comes. Wonder if she's speaking to me yet after my Happy Hour scene last night? ◀



A Chain o

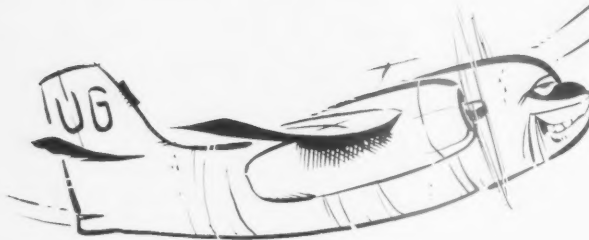
0800 – Brief:

Pilot (LCDR – 4000 hours): I'll be a little late, so you file and forge my signature on the "175," sign the "A" sheet, preflight, and I'll meet you in the cockpit (S-2).

Copilot (LCDR – 4000 hours): No sweat, pal.

Narrator: Hah! The copilot filed a TACAN aircraft via some VOR-only fixes, did not check NOTAMS, kicked the tires, but did not check fuel and oil, and strapped in with a euphoric feeling of "bush pilot par excellence."

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0845 – Engine start:

Pilot: Number 2 starter doesn't respond to the switch. Must be broke.

Copilot: Crap!

Pilot: Oh, the BATT and GENS are OFF! Now it works OK.

Copilot: Shoulda' read the checklist, I guess.

1000 – Just airborne:

Pilot: Gee, the No. 2 generator warning light sure is a pretty red color, isn't it?

Copilot: Crap!

Pilot: Have it checked by maintenance at the stopover field, but if they can't fix it quick, we'll continue anyway.

Copilot: Good head, old salt.

1030 – Enroute:

Pilot: Gosh, you sure are good at navigating VOR airways with nothing but "cuts" on adjacent TACAN stations.

Copilot: No hill for a climber.

Center: You are 10 miles south of course.

Copilot: Crap! Have to use more "J" factor, I guess.

1130 – Nearing first stop:

Copilot: TACAN locked on NAS Stopover.

Pilot: OK, Ace.

Narrator: TACAN is actually on nearby civilian station.

Approach Control: Vector 270 for visual approach to NAS Stopover, following big bird in a right turn.

Pilot: Big bird and field in sight.

Approach Control: Roger, contact tower.

Copilot: Tower, we're 10 east for landing.

Tower: Roger, continue for straight-in.

Pilot (to copilot): Call short final, gear down.

of Noodles

(All Weak Links)



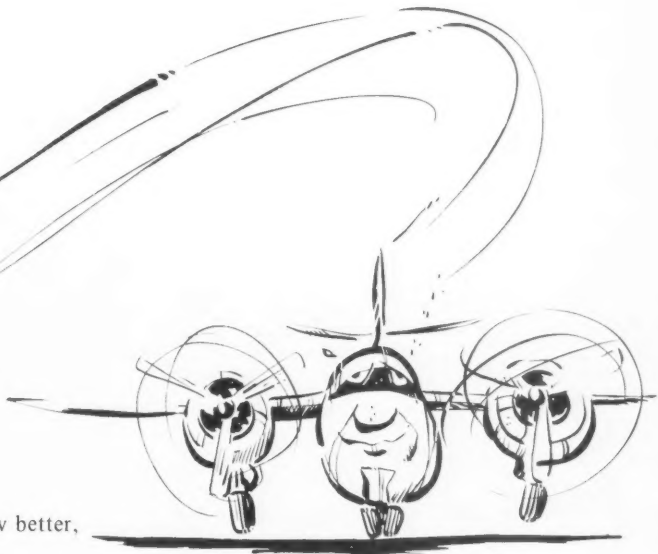
Copilot: Tower, we're one-half mile for full stop.

Tower: Not in sight, go around!

Copilot: Tower, you should be able to see us, we're over the approach end . . . oh, wait . . . out!

Copilot (in awed voice to pilot): We've just buzzed the local civilian airport.

Pilot: I'm gonna' cry.



17

1145 — On deck NAS Stopover, in snack bar:

Pilot: What's the matter with us, we both know better, but we're aviating like dodos . . .

Copilot: Yeah, like we're in a "Twilight Zone" movie. Oh well, the next leg will be OK, 'cause these are my old stompin' grounds.

1300 — Airborne, enroute to NAS Stopover No. 2:

Pilot: What's the wx, old buddy?

Copilot: I dunno. Didn't really listen to the forecaster, I guess. But it oughta' still be OK, 'cause I would have remembered anything significant. (Good old bush pilot feeling coming on strong.)

Pilot: What do you think is wrong with No. 2 generator?

Copilot: I dunno. Transient maintenance couldn't find the problem. But don't sweat. If it was mechanical, it would have dropped off by now. Ha, ha!

Pilot: Yeah (chuckle), we'll down it when we get home tonight.

1600 — On deck at NAS Stopover No. 2:

Copilot: You know, we haven't been too bright so far. Whadda' ya' say we RON here because I'm scared to fly until I get my head screwed back on.

Pilot: Me, too. Maybe a good night's sleep will dissolve the cobwebs.

Narrator: Hooray! These two finally did something right! Yes, I was the copilot on this horror trip. I still haven't figured out that day. Maybe 13 years and 4000 hours of "hacking it" led us down the rosy path of "It won't happen to me." Whatever, I've learned a valuable lesson at no cost, but it could have been a disaster.

LCDRmouse



THE CAMPAIGN

... bird strike season

Early each winter, from Alaska across the Canadian Arctic to Baffin Island, Great flocks of migrating waterfowl prepare for their annual assault on the lands to the south...

THE CONFERENCE room is hushed. Nervous briefers, their opening remarks memorized, shuffle from one foot to the other. All members of the Central Committee and Battle Staff are seated behind their nameplates... the moment is near.

The air of expectancy is intensified when The Commander enters. He settles in his large leather chair, fishes a long black cigar from his blouse, inspects it thoroughly, bites off one end, and holds a flame to the other. When the acrid blue smoke has entirely enveloped his head, The Commander speaks:

"I am pleased to see that every member of NAWDO (North American Waterfowl Defense Organization) is represented at this meeting. It is of utmost importance that each of you understand the details of this year's campaign. The information you carry back to your flocks from this meeting will affect the success of our migration to the south.

"Every year, the opposition becomes stronger. There are more and more hostile vehicles in our flightpaths. We must improve our tactics, sharpen our timing, and plan

carefully to make the greatest number of our sorties effective."

The Commander leans forward and slowly looks at each delegate around the table.

"NAWDO represents the largest nations of migratory waterfowl in this half of the world... through a carefully coordinated, combined effort, we are capable of doing significant damage to the forces that oppose us. We must do this! We must keep our lines of communication open between the summer nesting grounds and our winter resorts!"

"Proceed with the briefing..." With a wave of his hand, CINCAWDO turns his chair to face the large screen on the wall.

The Senior Briefer turns on the light at his podium and makes the few, short, shuffling movements that all speakers do before they start to speak.

"Commander, members of the Committee, Staff, and Honored Guests... the campaign to the south this year will be conducted in very much the same manner as in previous years. We have learned that our basic plan of assault is eminently successful... each year, we have generated grave concern within the ranks of the enemy. One of the supervisory agencies that governs the aircraft

traffic along our routes, the Federal Aviation Agency, has set up a great hue and cry warning of the effectiveness of our autumn campaigns.

"Similarly, another agency, the Naval Safety Center, has evidenced grave concern. And several other agencies are studying the effects of our suicide squads on airframe components and aircraft engines.

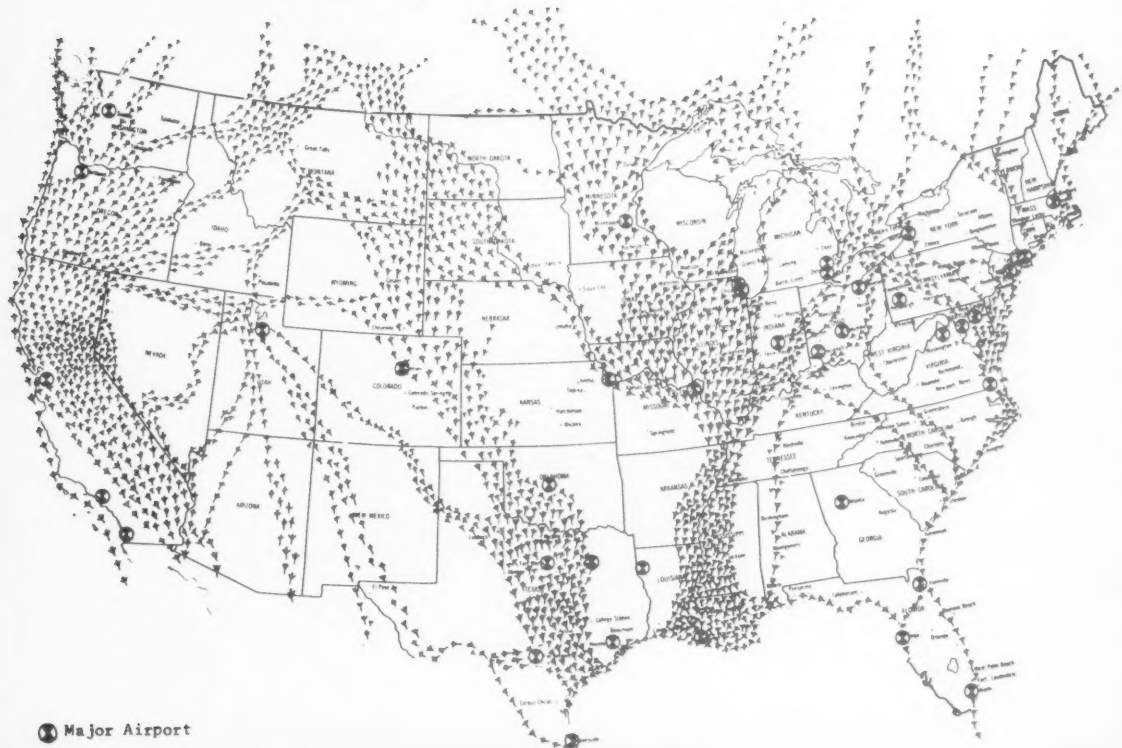
"As you will see in the presentations to follow, we will concentrate our assault in the lower altitudes. Detailed study and analysis has shown the enemy to be most vulnerable at 10,000 feet and below. Large numbers of their slow-moving aircraft are to be found along the low altitude airways. And traffic density around airports to the south is growing each year."

The Senior Briefer looks across his audience. When the introductory slide flashes off the screen, another to the right comes to life with a map of the United States.

"This is the target area! It is crisscrossed with airways and dotted with airports! Each one presents a potential threat to the very existence of NAWDO. The forces at our disposal to counter this threat are legion!"

"Our basic attack force will consist of approximately 24 million mallard and pintail ducks... for saturation effect. Phased throughout the entire campaign period,

Migratory Bird Flight Patterns



the lightweight and versatile mallards will be deployed en masse into the Mississippi Valley and the Central Valley of California. A smaller force will foray down the Atlantic Coast.

"Pintails will sortie over an equally broad front across most of the western states. Main routes will be through the interior and the Pacific states, again covering the entire campaign period from September through December.

"Lesser Snow Geese, originating from bases in the arctic, will be utilized through central Canada and into the Mississippi Valley to follow the first wave of ducks. Operating over a very large area, they will range across most of the airports in the Valley. Starting in early October, they will attack targets in Michigan, Ohio, and Indiana. The effect of this force will peak along the Gulf Coast in Louisiana and Texas during late October and November.

"We will employ Greater Snow Geese in a long-range role again this year. Their demonstrated ability to operate effectively on nonstop strikes makes this a natural assignment. These raids will be launched during November and December from bases on Baffin Island into targets along Atlantic coastal bays from New Jersey to North Carolina.

"Several squadrons of Canadian geese have been alerted for action on the Atlantic Coast in the Maryland area from mid-October through the first week of November. Although other units of Canadian geese will sortie down the Pacific Coast during the third week of October, penetrations into the interior by these units will commence as early as the end of September and continue into December. Because of their long-range capability and weight, which averages from 8½ to 9 pounds, the Canadian geese are considered one of our most effective weapon systems.

"Adding to the campaign on the Atlantic Coast will be units of middleweight, Double-Crested Cormorants. Operating in flights of approximately 200, they will be utilized to harass and interdict air traffic along the coastline and penetrate to both coasts of the Florida peninsula. Some mass raids of up to 1000 individuals are planned. The Cormorant missions have been underway for 2 months and will continue into early December.

"Whistling Swans, our most effective heavies, will again be used against selected targets. Weighing over 15 pounds and carrying a wingspread of 5 to 6 feet, their destructive power has been proven in one encounter after another. Whistling Swans will operate in large formations from mid-October to late November, interdicting traffic in the vicinity of busy airports. Specific attacks are planned in the vicinity of airports near Milwaukee, Detroit, Buffalo, Pittsburgh, and



Baltimore. Special sorties are programmed into the Washington, DC, area. All of these flights will terminate on Chesapeake Bay and the coastal sounds of Virginia and North Carolina.

"In the West, additional squadrons of Whistling Swans will attack target areas on the Great Salt Lake and on the Pacific Coast from Puget Sound to the San Joaquin Valley. Although the first sorties into Oregon will be in early October, their activity will peak from mid-October to late November."

As the last of his slides clicks off, the Senior Briefer looks pleased and relieved. His audience was interested and attentive. They will listen carefully to what follows.

The Tactics Briefer is a studious-looking bird, prematurely aged and scarred from several close calls. He explains the suicide-squad concept and describes the selection and training of these young heroes. He goes into detail on the vulnerability of various enemy aircraft:

"We have found that most of the very high-speed aircraft... the smaller ones... are equipped with a collision-proof windscreen. Direct frontal attacks seldom result in a kill. Nevertheless, these aircraft are invariably equipped with an engine very susceptible to our attacks. The slower-moving... and usually larger... aircraft models normally suffer more damage from attacks against their windscreens. Their propeller-type engines are more difficult to damage. Our heavier attack types

have been trained to aim for empennage surfaces on the large, slow-moving transports. Here, again, Whistling Swans have had notable success!

"Analysis of data from previous campaigns reveals that the diving, head-on attack is particularly effective. Pilots of enemy aircraft normally observe only attackers directly in front and above them. Their evasive action . . . if any . . . is invariably to descend. Armed with this information, our attackers have successfully anticipated evasive action and pressed their attacks home.

"Squadron formations will remain the large V. Experienced flight leaders find the maneuverability, search capability, and defense of this formation better than any other.

"As you can see from this slide," the Tactics Briefer continues, "careful planning allows us to cover virtually all altitudes below 8000 feet. Some high-altitude penetrations are planned to keep the enemy off balance." He pauses while the delegates study the details of the altitude tables.

When the slide goes off, it is replaced with a slide showing weather expected during the campaign period.

"You will note that our campaign coincides with the first outbreaks of cold air across the United States. We have learned that by following these cold fronts as they sweep south, we are able to take advantage of favorable winds. In addition, we maximize the range capability of our larger weapon systems by allowing them to stay in the cool air as long as possible. This reduces fatigue as well as providing the beneficial aerodynamic effects of a denser atmosphere. Our largest mass-effort raids will be timed to operate 24 to 48 hours behind each outbreak of arctic air."

The Air Intelligence Officer follows. His presentation

covers the various defensive tactics observed in the vicinity of enemy airfields during past campaigns. He points out that most of these measures are aimed at the local nonmigratory bird population. Therefore, they are seldom a serious threat to the NAWDO campaign.

The AIO also covers the effect of small arms fire on the attack forces. "While sportsmen have been known to occasionally disrupt a strike of the smaller attackers, these flights are usually able to get through by the sheer weight of numbers.

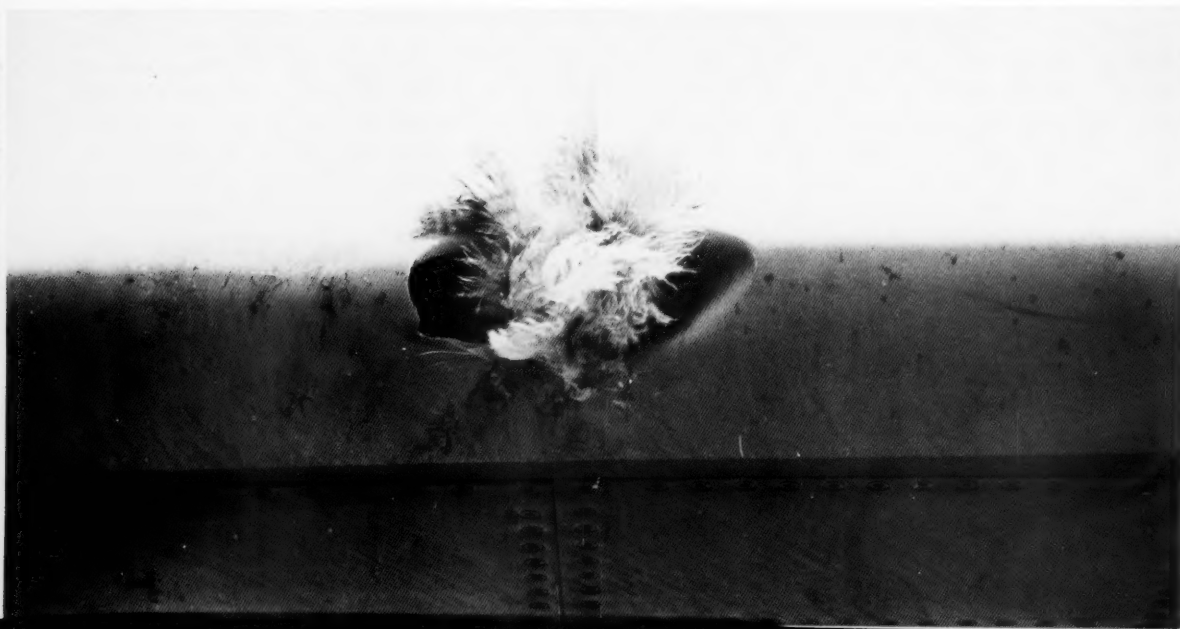
"Nevertheless, our information sources have detected a serious effort by some agencies in the south that threatens our long-range, heavy attack forces. Although information is fragmentary at this time, it appears that research and development has been underway for years to track our raids on defense and air traffic radar. If the enemy is successful in developing techniques to accurately plot our movements, he may be able to provide effective warning to our targets. Such warning . . . and subsequent vectoring of aircraft away from our flightpaths . . . will require us to rapidly develop countertactics for our forces. This year, we are requiring each mission leader to include remarks in his final report of any activity that will aid us in assessing this threat."

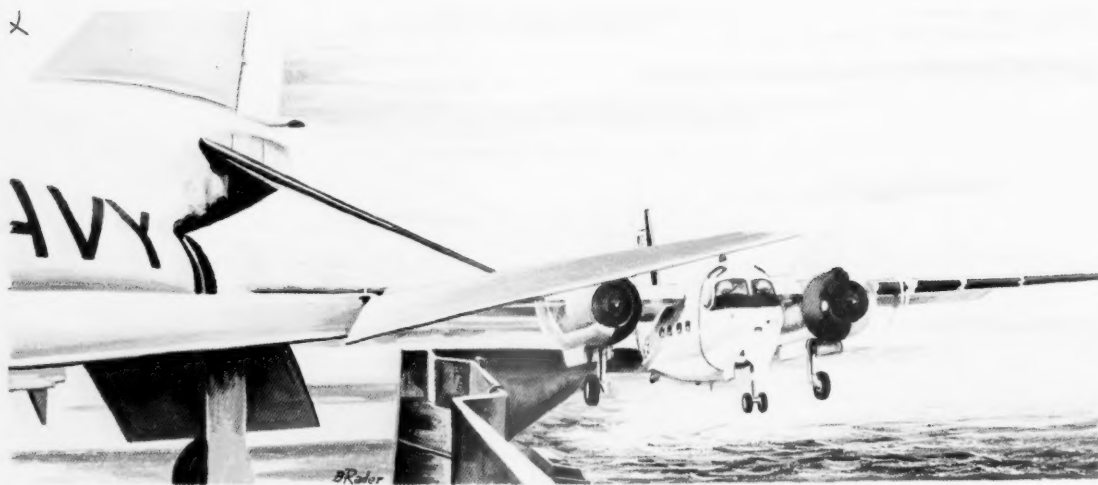
The Intelligence briefer leaves the podium. He is followed by the Senior Briefer who, with a few remarks in summary, returns the meeting to The Commander.

"You have seen the big picture, gentlemen," he thunders. His cigar is gone now . . . he is directing all his attention to the delegates in front of him. "Carry the impact of this briefing back to your forces. We cannot afford to let up in our struggle!!"

The 1974-75 Campaign is on!

Courtesy *TAC Attack*





FREE DECK LAUNCH OPERATIONS

22

WITHIN a 2-day period, NAVSAFECEN received two significant C-1A incident reports, paraphrased as follows:

(1) Onboard a large carrier, a C-1A was positioned for an angled-deck launch with a second C-1A positioned directly behind. No. 1 was launched and No. 2 rolled as the first became airborne. No. 2 observed that No. 1, encountering severe turbulence, had swerved violently to the right immediately after takeoff, then noted an F-4 on the bow facing 45 degrees right of the ship's heading deflecting jet blast directly into the path of the aircraft.

The pilot considered aborting, but was unable because of distance remaining. He initiated early liftoff and rapid climb to minimize effects of jet blast. The copilot also noted an additional aircraft (an A-6) positioned athwartships in the vicinity of No. 3 elevator, also pointing jet blast into the aircraft's flightpath. The pilot reported feeling no unusual effect from the *Intruder*, however, his concentration was focused on evading the *Phantom's* blast.

Page 4-7 of the CVA/ CVS NATOPS specifically addresses the problem of jet blast during free deck launching. In this instance, the pilots were successful in maintaining control and remained airborne. Under different circumstances, such as a max load/minimum wind launch, the aircraft would be at minimum liftoff speed. The additional effects of the jet blast could then

be sufficient to cause the pilots to lose control. Jet blast directed into the path of an aircraft during a free deck launch needlessly places the aircraft and crew in jeopardy.

(2) Aboard a small carrier, a C-1A was positioned about 20 feet forward of the ramp for an angled-deck launch. Wind over the deck was expected to be 27 knots after the ship had completed its turn into the wind. The pilot was given a turnout signal and was told by the tower that the ship was in a slight port turn. The pilot went to full power and commenced his deck run. He attempted to rotate at the elevator with negative response. The aircraft departed the angle deck straight ahead in a flat attitude. The gear was immediately raised as the aircraft settled to within 20 feet of the water. The copilot noted 65 KIAS upon leveling with the gear up. Once the aircraft gained sufficient flying speed, a positive rate of climb was established. Actual wind-over-deck was 18 knots. The temperature was in the mid 80s with the humidity in the mid 60s. The aircraft had 9 persons aboard, including 6 passengers, and weighed 22,000 lbs. The COD was the only aircraft under the tower's control at the time of the incident. The air boss, by launching without positively confirming adequate wind-over-the-deck, nearly created a catastrophe.

Had the latter wind condition existed in the first case, the aircraft would have undoubtedly been lost.

THE POSITIVE APPROACH TO SAFETY

By CDR H. L. Fremd

YEARS ago, the local witch doctor would conjure up brews and far-out dances (with proper accouterments) to drive away evil spirits and cure other assorted ills. By and large, the primary ingredient in any such cure was fear — either the direct type (scare hell out of 'em) or the indirect type (fear of the unknown).

We know that for the most part medical science has advanced beyond this type of treatment (except for the flu shot), but can the science of aviation safety make a similar claim? We see gory pictures of aircraft crashes, bodies, damaged facilities, etc., promoting (?) safety, but is it valid in this enlightened age to resort to such medieval tactics to get people to really believe?

Some individuals may heed nothing less in the way of warning. Moreover, many of us — you and I — lack the imagination, ambition, and time to devise a better system. We tend to think of safety in the same way some people think of religion: It's here and it's difficult to object to the idea of it, but we don't want to be bothered with it all the time. Nevertheless, a rational appeal to reason undoubtedly offers the greatest potential for improved safety.

Fortunately, there are many who are willing to give the idea of accident prevention — positive safety — more than just lip service. Just how are you and I exposed to the idea of positive safety? First and perhaps most well-known is NATOPS. In this series of publications, an attempt is made to help pilots and other associated personnel learn from the mistakes of others. NATOPS lends continuity to any and all phases of aviation during the "change of watch" as well as being a ready, current reference for the novice and pro alike. Yet, from time to time, we still hear those who say, "You can't operate by the book." If so, maybe the book is inadequate, but has anyone taken the time to prepare and submit the changes necessary to update the book?

It's easier to say that the system is inadequate than to offer a positive plan for improvement. If *you* really believe in a positive safety program, take the time and make the effort to recommend improvements in the system whenever you see the need.

Another area of positive safety is the 3M system. Sure, it's troublesome to change our concepts and ways

of doing things; but as this program becomes more productive, we see our supply problems diminish, problem areas being pinpointed earlier, and funds permitting, corrective action being initiated. Here again is a positive approach to safety.

The aviation safety officer who is fully supported by the CO is a positive force for safety. And the CO who believes in the positive approach to safety will do well to ponder these questions:

- Is your ASO selected from the best qualified and most highly motivated officers in the squadron? He should be as he represents *you* in matters of safety.
- Is he selected for all the "good deals" that come along, i.e., fund drives, courts and boards, etc? He shouldn't be; safety is a full-time job.
- Is he given active support at all officers' meetings?
- Do you have periodic talks with your ASO and provide positive guidelines for your safety program?
- Do you ensure the wholehearted cooperation of all other departments in the squadron?

This is by no means a complete list of pertinent questions, only a starter — food for thought.

Now that we have considered the command element in the positive approach to safety, how about you, Mr. Pilot and Mr. Maintenance Officer — and you, Mr. Plane Captain? Give these questions some thought:

- Have you thought about ways to do your job more effectively and more safely? If so, have you discussed your thoughts with your ASO? If not, why not?
- Are you reporting your experiences to help others — URs, incident reports, and Anymouses?
- Do you *help* the ASO in his safety surveys, or are you always trying to "cover your six?" If you're wrong, do you admit it and strive to improve?
- Do you try to beat the system? You shouldn't. If the system does not provide the framework for correct and safe operations, recommend the needed changes.

The positive approach dictates that safety be regarded as a way of life to be cultivated, not only in your assigned field, but in *all aspects of everyday life*. It will pay great dividends in the long run, especially for those of us active in the field of naval aviation. ◀



PROCEDURE CARDS

Who Needs 'em?

By LCDR John J. Zerr
Student Aeronautical Engineering
USNPGS, Monterey, CA

24

A CURSORY glance at the yearly naval aviation accident rates of the past couple of years indicates that the declining trend has leveled out. How do we get the rate on the skids again? One way would be to discover hazardous areas of the operating environment which have hitherto escaped attention.

At first thought, it might seem that there are no longer any general areas of hazard which have eluded our safety sleuths. Although the safety field has been pretty thoroughly covered, I believe there is still a virgin region — or at least semivirgin in the dimension of depth.

Of course, the safety program for the Navy already exists in three dimensions. It begins with CNO in its most general form, then pyramids down through the chain of command, picking up specificity until it reaches the individual pilot with his personal copy of NATOPS. I suggest it's time to explore the subject in greater depth. It's time to jack up the pyramid and insert under the base a layer of specificity which goes beyond that attained by NATOPS. This, I hope to show, could do much to reduce the potential for accidents from unwarranted ejections and in certain critical phases of flight such as takeoff. It could also help reduce the potential for accidents among the less experienced types.

Example:

FEB '74 article entitled "What a Drag." An F-4J pilot attempted a night, no-flap takeoff. On overrotation, dragging stabilators caused the pilot to believe he was on fire, and he ejected. The article cites a NATOPS caution which predicted the actual flight characteristics of the aircraft in that configuration.

Buy 'em books, and they eat the covers, right? At best, maybe. According to the article, the pilot thought he was airborne and on fire. A NATOPS caution concerning overrotation was not likely to be in the forefront of his consciousness. What the pilot needed to know in this set of circumstances was what happens when you drag stabilators. Had he known, even after forgetting the checklist, he still may have been able to save the situation.

Further, the pilot in the article stated that he was spring loaded to eject if he encountered trouble on takeoff. The takeoff evolution is widely regarded as one of the more inherently dangerous phases of flight, so a little spring loading is certainly understandable. Anticipating hazards and planning responses to emergency situations seems to be the professional way to go. In the instance cited, however, a bit more flexibility certainly seems to have been in order.

There was information in NATOPS which was pertinent to this accident, but its pertinence was limited to the post mortem. What is needed is to organize the knowledge we have in a more efficient manner. If there were a block of takeoff emergency data, for instance, as a pilot rolled out onto the runway, he could be thinking "takeoff emergency" with a section of his mind programmed to handle just that type of emergency.

To cope with emergencies, a pilot integrates NATOPS with his experience and knowledge and comes up with his own personal plan of response to situations he is able to anticipate. There are vast differences of knowledge and experience; consequently, we could reasonably expect like differences to exist in personal emergency plans.

I suggest a formal training program be established in aviation activities to promulgate recommended emergency response plans for operations in the critical portions of the flight/ejection envelope.

To establish the program, a committee with a rotating membership of four or so experienced-in-type pilots and NFOs could be set up to review the various critical phases of flight for their type aircraft as operated by their squadron. They should consider which system malfunctions are critical and attempt to anticipate the various ways a particular evolution could be fouled up, such as attempting takeoff with the canopy open, the flaps up, wings folded, etc. Then they could attempt to

Sample Procedure Card
Day Cat Shot Emergency

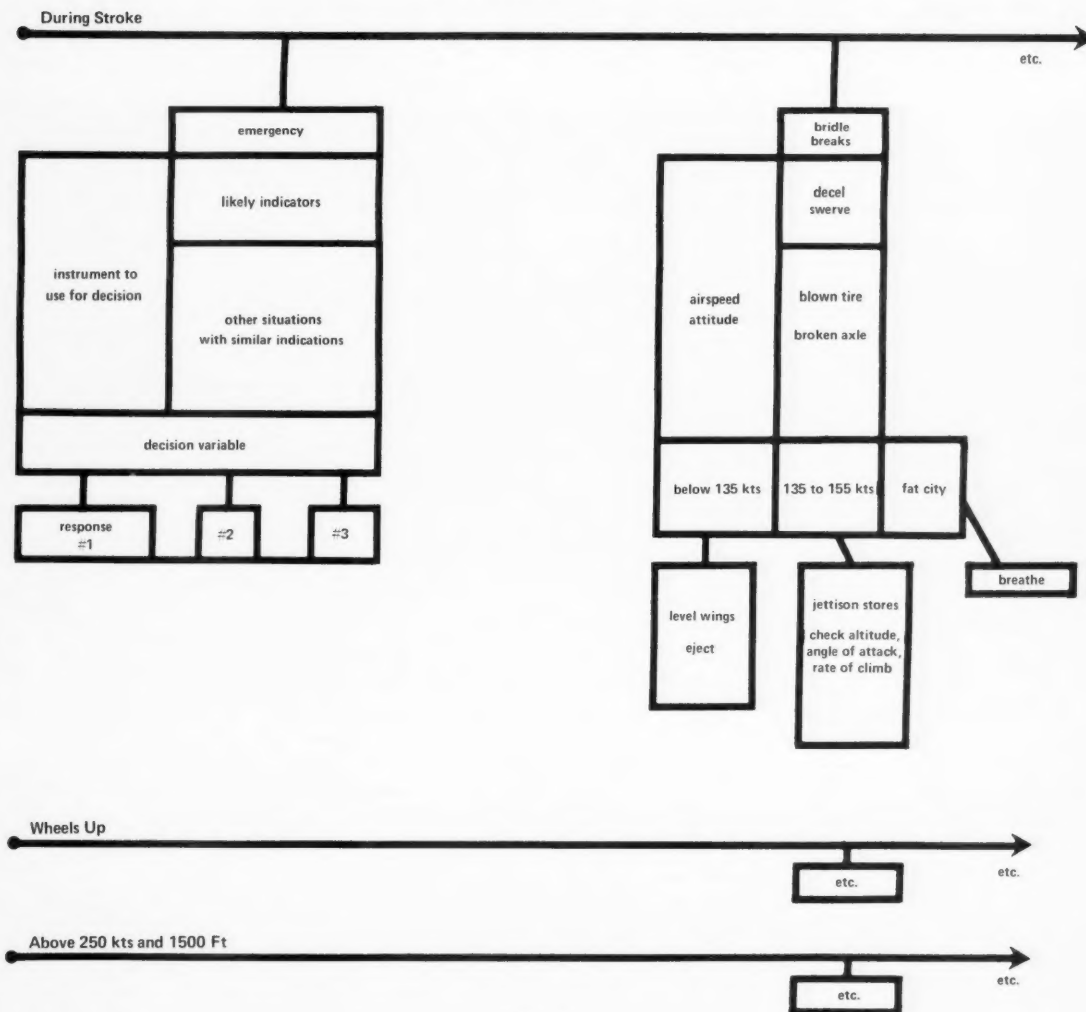


Fig. 1

isolate specific indications of the actual situation, i.e., which specific instruments or sensations would provide the most reliable information so that situations with similar symptoms but drastically different diagnoses can be distinguished.

In critical portions of the flight/ejection envelope, decisionmaking time is severely limited. The problem is then complicated by the possibility of several drastically different situations providing us with similar indications. A well thought out plan which anticipates as many as possible of the emergencies which could occur, which provides for discriminating between similar symptoms, and which terminates in a planned set of responsive

actions, certainly seems better than a single-action, spring-loaded type. And a plan drawn up from the pooled knowledge and experience of several grey eagles certainly seems better than a plan which can draw from the resources of only one individual. I suggest something along the lines of Fig. 1.

I realize this program sounds an awful lot like procedure cards, and for anyone who can remember Saufley Field, using procedure cards surely doesn't sound like something a professional aviator would want to use. Therefore, let me hasten to point out that the real name of the program is "Anticipating Emergencies, Analyzing Alternatives, and Planning Responses." ◀

NADC* Works for Flight Safety

* Naval Air Development Center, Warminster, PA

STRESS is the name of the game at the NADC human centrifuge. Inside its confines, human beings have been buffeted, spun, depressurized, and catapulted — all in the name of flight safety.

Standing three stories high, the gray, circular building is the most visible sign of NADC's concern with flight safety. Here, and in several other buildings, 200 members of the CSD (Crew Systems Department), including physicians, psychologists, physiologists, physicists, engineers, and even a veterinarian, work together under CSD Director CAPT Laurence Blackburn to make aviation safer and to improve the interface between man and machine.

NADC's centrifuge, one of the world's largest and most versatile, is just one of the tools used in the Center's continuing effort to improve aircrew flight safety. Built in the early fifties, it consists of a spherical gondola 10 feet in diameter mounted on power-driven gimbals at the end of a 50-foot tubular steel arm (see photo). Driven by a 4000-horsepower d.c. motor, the centrifuge can accelerate loads of 1000 pounds to 40G in 6½ seconds. It can also simulate near-space altitudes of 125,000 feet, with provisions for regulated temperature, humidity, and dual axis vibration.

Despite its initial design 22 years ago, the centrifuge has been kept up-to-date through numerous modifications and can simulate most parameters of the newest high performance aircraft. In the last few years, for example, it has simulated a Boeing 707, an A-7, an F-4, an SST, and more recently, an F-14.

Grumman pilots have undergone spin simulation inside an "F-14 cockpit," and commercial pilots have learned to cope with clear air turbulence. According to flight subjects, the simulations are amazingly realistic. On a recent A-7 carrier catapult test, one pilot hit the panic button to stop the centrifuge when he thought he was going over the side of the ship.

"I see the centrifuge as one of the most versatile tools in the world," says CSD's Dick Crosbie. "We have a capability not duplicated anywhere. Many places are investigating *individual* stresses (such as heat, buffet, altitude, light, sound, disorientation) that a pilot is routinely subjected to. But the world of a pilot is one of *combined* stresses.

"We can single out any one stress and put emphasis on it or apply multiple stresses, much the same

as they actually occur in flight.

"In our F-4 tests, we combined and varied buffet and G forces. You simply can't do that in flight."

In January of 1973, the centrifuge actually simulated the depressurization of an SST aircraft, marking the first time internal pressure changes and external acceleration forces were reproduced simultaneously.

Although it is mainly identified with its centrifuge work, CSD works to improve flight safety on various fronts.

Much of CSD's attention is focused on human factors design requirements. Naval Safety Center records show that improper crew station design of present aircraft has been a contributing factor in 228 aircraft accidents in the last 4 years, resulting in the loss of 249 lives and \$285,000,000 worth of hardware.

Scientists in NADC's human factors branch are now able to include man at the earliest stages of cockpit design. "Man has more or less been an afterthought in all our present day aircraft design," says Dino Mancinelli, Deputy Director of CSD. "Cockpits in modern day aircraft don't completely accommodate the pilot's abilities or limitations, but that's changing." Crew Systems personnel, he says, now make inputs concerning seating, cockpit geometry, lighting, location of instrumentation and displays, and the allocation of pilot and crew tasks.

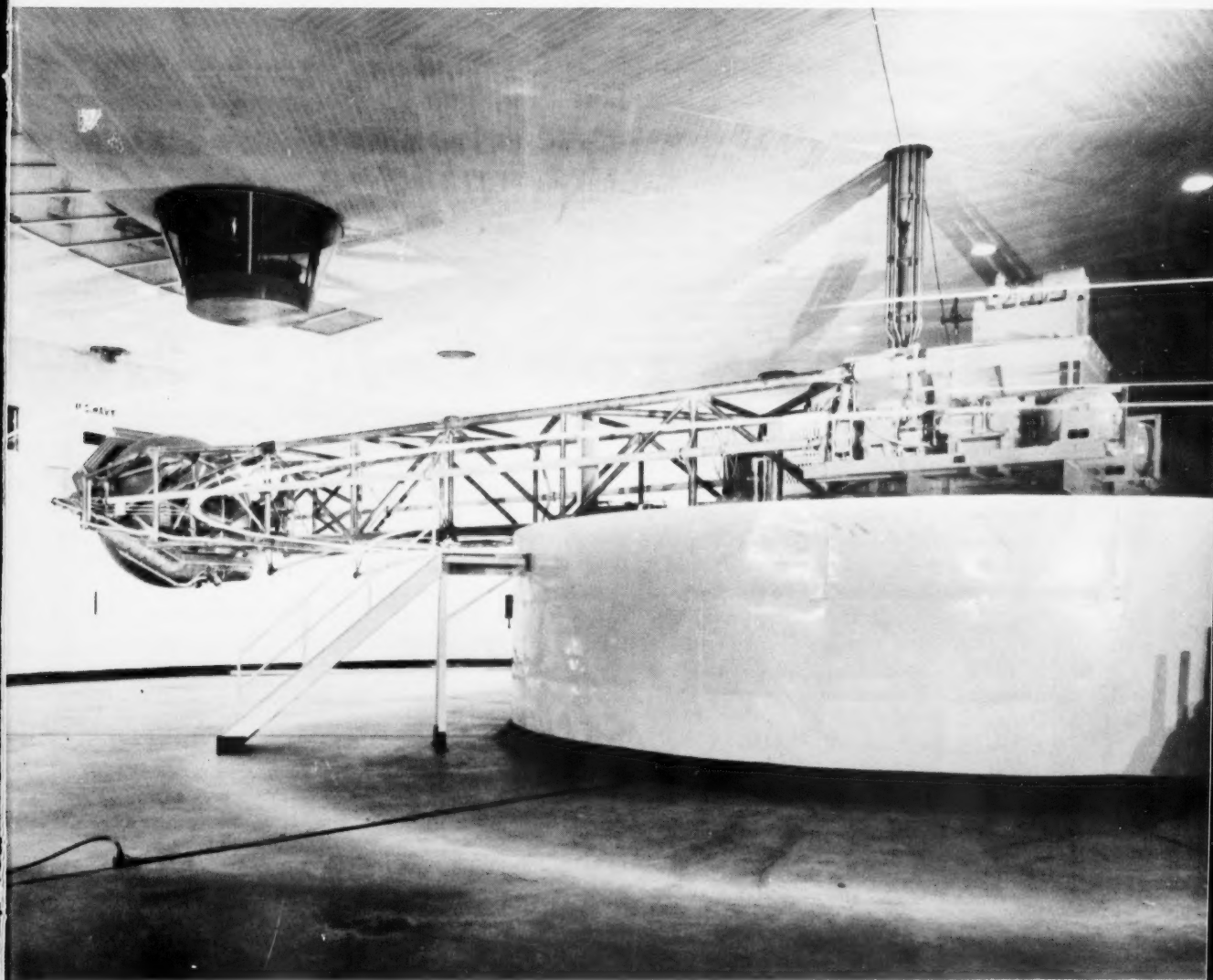
"There's just so much information presented to a pilot during flight that it's difficult to absorb all that's required, resulting in a training and fatigue problem," Mancinelli says. "Man is part of the system, and we're trying to maximize the interface between man and machine, thereby maximizing his performance under any operational condition or situation."

In the area of Escape Simulation and Crash Safety, CSD is currently working on several different safety programs, including a lightweight, armored, energy-attenuating helicopter crew seat, a crashworthy troop seat for helicopters, a single-point torso harness release, a new pulsating seat cushion to reduce fatigue, and a new positioning and restraint system for ejection seats. An exploratory development program is also focusing on a maximum performance ejection seat that includes an adverse aircraft attitude and low level escape capability.

Other CSD personnel are improving life support and

survival equipment. CSD's philosophy is to give the pilot a mission-oriented system offering maximum protection with minimum discomfort and encumbrance. To accomplish this, CSD people develop the equipment, wear it, and get wet with it. They test it in swimming pools and under realistic survival conditions at sea.

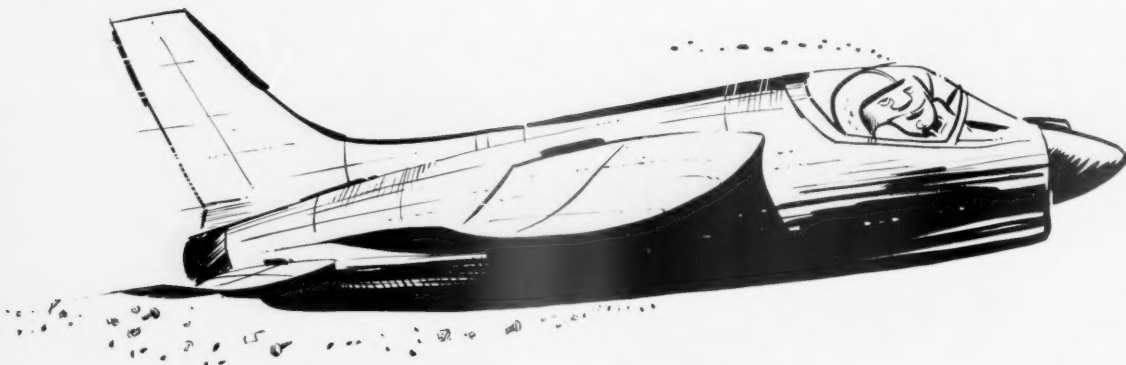
According to Mancinelli, the pilot ideally should not even be aware of his survival gear until he needs it. NADC engineers are now taking a systems approach to life support and survival gear and are integrating the various components into a total assembly that's dedicated to a given mission.



Naval Air Development Center's centrifuge — one of the world's largest.

Future systems will include a self-contained oxygen system that generates its own supply and does not require LOX (liquid oxygen); a survival system that automatically releases an aviator from his parachute and inflates his life preserver and liferaft; a new modular antiexposure system; a new, formfitting, lightweight helmet; and a new helicopter survival system.

Aircraft and their systems are designed with one ultimate goal — to enable man to perform his mission in an unnatural and often hostile environment. Research and development projects to take care of all aspects of man in the aircraft system and to maximize his effectiveness are now the mission of the multidisciplinary Crew Systems Department. ◀



Would You Believe?

By ASOmouse

THE FOLLOWING narrative is a good example of how a series of small problems can lead to a big one.

28

Because of an upcoming annual NAS airshow, a squadron had temporarily relocated its flight line some distance from its maintenance spaces. One of its F-8s, Hot Shot 102, was scheduled for a 0800-0900 flight. During the poststart ground checks, the pilot, LT Terry Firma, noted that the flight controls and related hydraulically operated systems were sluggish. In addition, roll stab would disengage, and the UHT would not return to neutral.

LT Firma summoned a troubleshooter who checked the systems with the pilot at the controls. At this time, the systems appeared okay, but the troubleshooter said the entire system would have to be checked completely. Since it was too late by this time to make the scheduled sortie time, LT Firma cancelled his hop and wrote a "down" gripe against H.S. 102. Maintenance control immediately called the shop which dispatched a crew to the aircraft.

The plot now thickens. Prior to LT Firma's man-up that morning, LCDR Jepp Ardy had called maintenance control and requested that the discrepancy log and yellow sheets for H.S. 102 be brought to the aircraft at the prescribed time for his scheduled 1000-1130 flight. Since his office was near the temporary flight line, this would eliminate the inconvenience of his having to walk over to maintenance control. It had been standard policy to do this for the pilots' convenience and elimination of time lags that might delay important flights. LCDR

Ardy's request was received and verbally agreed to by AN Jones, the maintenance control "phonetalker."

After LT Firma downed 102, maintenance control assigned H.S. 105 as a replacement and notified the line to preflight and daily the aircraft for LCDR Ardy's 1000 go.

At this crucial point in the chain of events, LCDR Ardy was unaware that H.S. 102 had experienced any problems and was on his way to the aircraft.

Arriving at his "assigned" bird at 1005, Ardy was informed by a plane captain that the previous pilot had experienced control problems, but that the troubleshooter had said all systems were working properly. Ardy was also informed that maintenance control carried the aircraft as "down." LCDR Ardy told the plane captain that the aircraft was evidently up, as the troubleshooter had checked it and said it was okay, and that maintenance control must have thought the same thing because they had agreed to bring out the yellow sheets.

After this discussion, Ardy proceeded to man H.S. 102 and, even though once again asked by the plane captain about checking with maintenance control, continued his start procedures. On poststart control check, all systems appeared to function properly. At this time, the plane captain was directed to send someone to find out what the holdup on the yellow sheet was. Another plane captain was dispatched to call maintenance control, received busy signals, and subsequently went there personally. Upon arrival, the

plane captain asked AN Jones for the yellow sheets. He took 102's "logbook" and a blank yellow sheet back to the bird and informed LCDR Ardy that the yellow sheet was not filled out because there had been no new preflight following LT Firma's abort. Ardy told them it was all right, that he would sign it, and that they could fill it out later. He then taxied out.

At this point, the maintenance crew arrived to work on H.S. 102, saw it taxi out, and immediately called maintenance control. Upon hearing this, the maintenance CPO called the tower and requested they relay to the pilot, who was now airborne, that his aircraft was down.

Upon receiving this information, LCDR Ardy replied that all systems were functioning properly, that he had not experienced any problems with sluggish controls prior to or after takeoff, and that he was *electing to continue the flight!* Fortunately, 20 minutes later, the aircraft landed safely.

Several circumstances were involved in this potentially disastrous chain of events:

- Lack of adequate communication between all factions involved.
- Displacement of aircraft from vicinity of maintenance spaces.
- Pilot speaking to an unqualified airman vice the maintenance control CPO concerning maintenance matters.
- Nonstandard aircraft checkout procedures.
- Pilot not reviewing aircraft discrepancy book and accepting an aircraft not signed off.
- Continuation of a flight with a down gripe.

Since this occurrence, the squadron has introduced new policies concerning aircraft checkouts, discrepancy logs, and yellow sheets, and has emphasized the necessity of consulting supervisory personnel on maintenance matters. Needless to say, the thoroughly unprofessional and unsafe manner in which LCDR Jepp Ardy performed has been brought to his and other squadron pilots' attention. ◀

MEANINGS

DURING a recent VP-46 standdown, the safety officer kicked off the first day with a brief on the subject of communications. Because his words and meanings are applicable to everyone, they are being printed here for your interest and contemplation.

"We each have our own meanings for the words we use. We learn these meanings from experience. Since no two people ever have the same experiences, no two of us ever have exactly the same meaning for anything.

"We all make judgments about people on the basis of what we see. Therefore, instructions and directions must be explicit and direct. Communicating is hard and has a chance of breaking down any time. When this happens, our first reaction is to blame the other man.

"It usually doesn't help to view a communications breakdown as somebody's fault. We must create a working climate in which people will feel free to ask for clarification if the instructions are not clear.

"Supervisors must give adequate and clear instructions.

"Ensure you understand what is expected of you. The pressure is always on us to say 'yes' whether we understand or not.

"Meanings are your own view of the world. What's real to you is real *only to you.*"



Letters

Experience helps, but somehow you never have it until just after you need it.

Ace L.

High and Hot

Norfolk, VA — Re your article "High and Hot" in the July issue. One factor which the pilot overlooked which might have saved the aircraft, as well as himself, was to jettison external stores. This would have reduced his aircraft weight sufficiently that he might have salvaged the takeoff attempt.

USAF pilot
ex-Exchange Pilot with Navy

30

● Right you are. We don't know for sure what lay underneath his flightpath, but assuming he was clear of populated areas, he should have considered jettisoning stores.

UR Responsible

NAS North Island — Poetically:

When systems fail to do
What Lockheed says they should,
And any time a piece of gear
Just doesn't look too good;
Any time a mishap makes
A plane abort its flight;
Or any time a pilot feels
That something's just not right;
It's his responsibility
To make sure that all concerned
Have ample opportunity
To learn what he has learned.
Just take a minute of your time
And tell it to QA.
We'll draft a UR in your name
And send it out today!
If every pilot/NFO
Wrote one UR a day,
The problems that are with us now
Will soon have passed away.

LCDR Daniel Rumbley
QA Officer, VS-41

Reporting Visibility in Fog

FPO, San Francisco — On pg. 26 of the March *APPROACH*, in the article entitled "Lack of Planning," there is reference to an air station being IFR with 3 miles visibility in fog. Similarly, there is an article on pg. 4 of the 24 FEB - 2 MAR WEEKLY SUMMARY that refers to an air station with 1½ miles visibility with fog. These two references have caused discussion and have brought to light a possible misunderstanding of weather reporting terminology.

On pg. 2-24 of the NATOPS Instrument Flight Manual, under the paragraph on fog, the following quote is found: "Fog is reported when the horizontal visibility at an air terminal is reduced to less than 5/8 mile." Although it is not specified, it is assumed that the visibility referred to here is the prevailing visibility. Possibly, this portion of the NATOPS Instrument Flight Manual is not common knowledge among pilots and weather forecasters. If the fact is emphasized that when a pilot hears the report that the intended point of landing has fog (visibility of 5/8 mile or less), the report may well serve as another factor that the pilot can crank into his mental computer and anticipate a possible waveoff at minimums. Additionally, a possibility exists that further education is needed on the part of those who forecast weather. Maybe another phrase such as "fog is forming" should be used until the visibility drops to 5/8 mile or less at the intended point of landing. What do you think?

J. N. Keathley
Force Safety and Standardization Officer
Fleet Marine Force, Pacific

● Your letter was referred to LCDR A. R. Carpenter, Instrument Training

Officer at VF-43, the squadron charged with clearinghouse responsibility for jet instrument matters in CONUS. His reply is reprinted below:

The NATOPS Instrument Flight Manual (15 June 1972), Section II, Part 1 (Introduction), refers to Meteorology for Naval Aviators (NAVAIR 00-80U-24, 1958). No substantiation of the information "Fog is reported when the horizontal visibility at an air terminal is reduced to below 5/8 mile" is found in Meteorology for Naval Aviators. Also, paragraphs 7-14, -15 (Visibility); 7-16 (Fog); and 7-19 (Weather/Obstructions to Vision) of the NATOPS Instrument Flight Manual indicate this information to be in error, as does paragraph A7-6, 2.2.11*, Chapter VII of the Federal Meteorological Handbook - 1 (FMH-1, Rev. 1-1-72, NAVAIR 50-1D-1). The Glossary of Meteorology, 1959, is a possible source of this information as an "International Definition" of fog.

Present procedure in the U.S. conforms to paragraphs 2-14, -15, -16, and -19 of the NATOPS Instrument Flight Manual and Chapter VII, A7-6, 2.2.11* of the Federal Meteorological Handbook, reporting fog in the same manner as other "restrictions to visibility." That is, as reportable when they restrict visibility to 6 miles or less. The Federal Meteorological Handbook is asterisked, indicating a change from the preceding handbook; a change that perhaps escaped detection and subsequent reflection in the NATOPS

APPROACH welcomes letters from its readers. All letters should be signed, though names will be withheld on request.

Address: *APPROACH* Editor, Naval Safety Center, NAS Norfolk, VA 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

Instrument Flight Manual. Further indication of this is the obvious contradiction within the NATOPS Instrument Flight Manual between paragraphs 2-24 and 2-14, -15, -16, -19, and 7-7, -8 (sequence report example).

The NATOPS Instrument Manual model manager has been contacted referencing this apparent contradiction and is considering appropriate changes to paragraph 2-24 of the manual.

Wants NATOPS Manuals

Peterson Field, CO - We, in USAF Flight Operations at Peterson Field, try to read every copy of APPROACH. We consider it a superior safety publication. In the JUN '74 Air Breaks appeared an article entitled "No Juice." The C-131 jocks did things which are in direct disagreement with our own technical order procedures. Previous APPROACH articles have highlighted areas which allowed us to improve operations by adopting the "Navy Way."

Our squadron flies T-33/T-29/C-131/C-118/T-39 and U-4 aircraft. If possible, we would like to get copies of the NATOPS for any of these aircraft the Navy is still operating. We want to compare our operating procedures with NATOPS with an eye towards improving our procedures, where possible. We are not advocates of a universal manual for both services.

Again, an attaboy for APPROACH.

COL Richard B. Nelson, USAF
Chief, Operations and Training Division
HQ 4600th Air Base Wing (ADC)

• Thanks for the kind words. We regret that we are unable to comply with your request directly; however, your letter has

been forwarded to the Navy Tactical Doctrine Activity, Washington, DC, for action. Here's hoping they'll be able to comply.

Abbreviations and Acronyms

Woodbury Heights, NJ - The world of abbreviations and acronyms makes it a bit difficult to keep up with the "state of the art" and the "order of magnitude" in the field of aeronautical progress. Regardless, I latch onto and enjoy reading every issue of APPROACH that is available.

If an ex-tailhook jockey cannot precisely dig your written words, I wonder how the other services (Army, Air Force, industry, etc.) fare on the deciphering. I'm really not so ancient that I can't converse to an acceptable degree with this generation of jockeys. I just say, "Yeah, I got time in the F-4 and the Corsair," but don't bother to qualify the statement that they are one and the same aircraft (F4U Corsair or "Hosenose" or "Bent wing thing").

That way, they don't have to explain differences between a *stovepipe* and a *corn-cob*, or *eject* vs *bailout*. I don't feel that I am alone in my ignorance and would appreciate background information or definitions on the following (all in the JUL '74 issue):

- Bravo Zulu
- Ace L.
- Delta Sierra

LCDR Wm. R. Clarke (Ret.)

• The Allied Naval Signal Book, ATP 1(A), Volume II, Chapter 15, Governing Groups, lists BZ as a *Well Done*. The

most common use of BZ is a signal flag hoist between ships.

Ace L. is the unknown phantom philosopher of APPROACH. His true identity is known only by our art director, who won't tell.

As for Delta Sierra, you'll have to let your imagination run wild and see what appropriate words you can make out of the initials D.S. (The first letter stands for *Dumb*.)



FLIP Changes

THE Defense Mapping Agency, St. Louis, MO, has notified the Naval Safety Center of the following changes to FLIP documents:

• *Jet Advisory Service*. Effective 10 October 1974, Jet Advisory Service will be discontinued. All references to this service will be deleted from DOD FLIP publications. The advisories formerly provided by this service will continue to be provided by normal Air Route Traffic Control Facilities.

• *FLIP Realignment*. Effective 7 November 1974, four Low Altitude Enroute Charts and associated Supplement data and Instrument Approach Procedures will be transferred to the Europe and North Africa publications from the Africa and Southwest Asia publications. These two new areas of coverage will be renamed Europe, North Africa, and Middle East (ENAME), and Africa respectively. High Altitude Enroute Charts are being developed for the new ENAME area of coverage and will be issued in mid-1975.

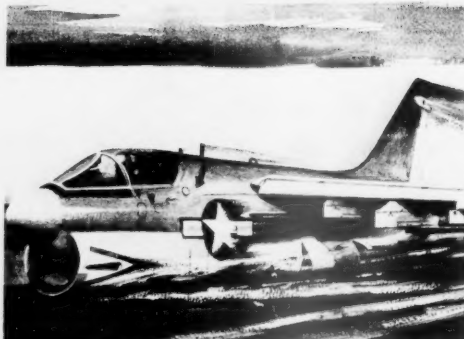
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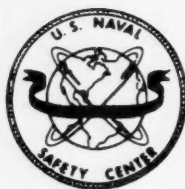
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CREDITS/This month's cover by Staff Illustrator Blake Rader shows a formation of the Navy's CH-46 *Sea Knights* in action. For some good words on helo escape it will pay you to read "Helo: No Easy Way Out," beginning on page 12. Pg 12-14 Diagrams Courtesy Teledyne McCormick Selph. Pg 18 Photo: Kenneth Jones.

Left of Center



THE PILOTS and crew of a P-3 were ready to depart Metro Airport after a record 16-inch snowfall. The airport had been closed for 2 days, and snow removal had been hampered by lack of personnel and equipment.

After filing, the PPC started the engines and began a long taxi to the one open runway. (The airport gang had worked hard to open it up.) The taxiway was a trough between 5-6 foot snowbanks. There was also an inch of glare ice under the snow.

At 1800, the airport was opened; at 1845, the P-3 was stuck.

The aircraft had approached the downwind end of the taxiway and eased left of the plowed centerline to provide clearance for No. 4 engine. (Wouldn't you know that very spot was solid glare ice and the wind gusted just as the pilot eased the *Orion* toward the correct position.) The aircraft slid sideways, out of control, and the port mainmount left the taxiway and became stuck about 6-8 inches deep in mud.

The snowfall had covered the taxiway markers and lights. The taxiway wasn't plowed its full width, and the area that was plowed was offset 6 feet to the left of center. This meant the taxiway wasn't normal — the outboard 2 feet was over soft mud.

Attempts to free the P-3 were secured at midnight when it became obvious, with available equipment, the aircraft couldn't be moved. A call to the squadron set up another P-3 to bring special equipment.

The next day, using the proper towbar, the digging out began. By this time, the ground was frozen and would support the weight of the defueled P-3 on Marston matting.

A long, sloping trench was dug with a jackhammer, and Marston matting was placed in front of the tires. The aircraft was then towed up and onto the taxiway. No damage had been sustained.

There's no question that professionalism is the reason this was an incident and not an accident.

The first proper decision was when the PPC quit trying to move his aircraft after he realized a wheel was stuck in the mud. Having the proper equipment (towbar, airbags, compressor, ice chocks, chains, and cold weather clothing) flown in prevented aircraft damage. But the well-trained salvage crew who took their time and did the job right was the primary reason for the success of the operation.

You can't beat *teamwork, coordination, and planning.* ◀



